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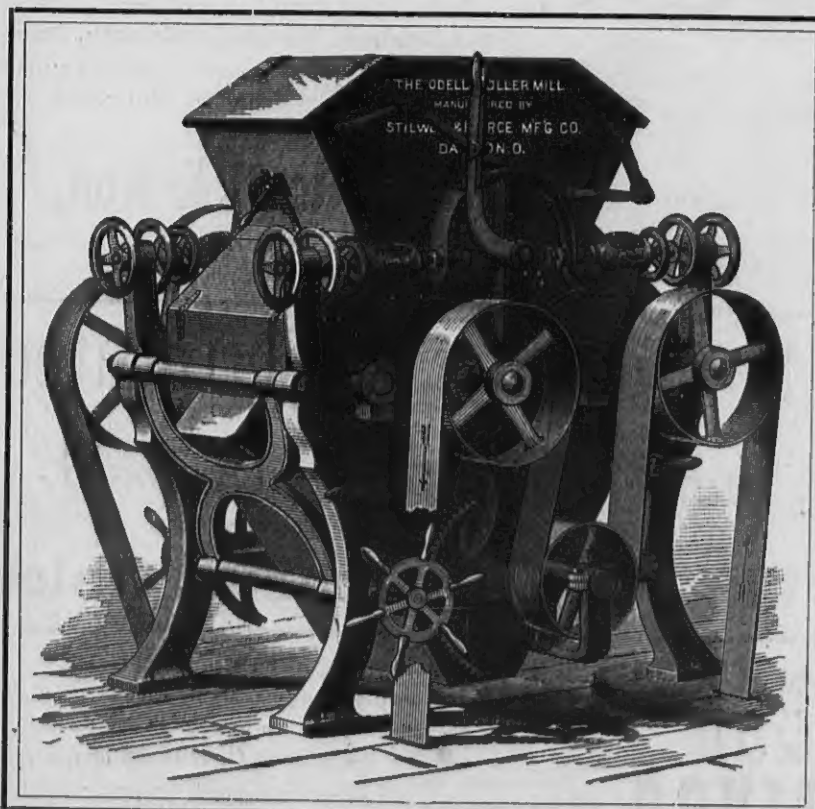
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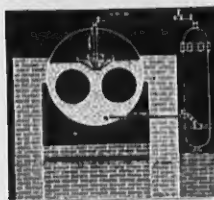
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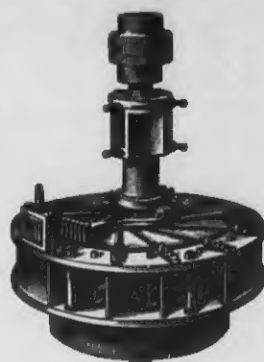
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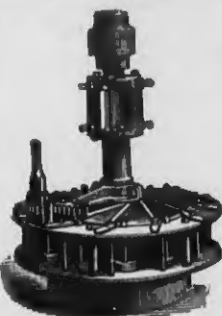
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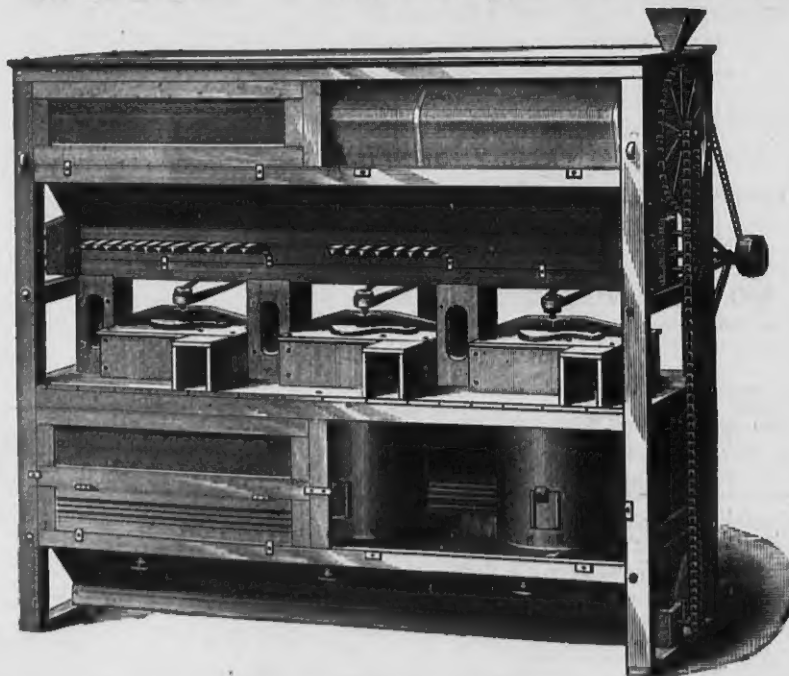
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THIS IS A NEW MACHINE WHICH MILLERS

MUST HAVE.

Immense Reduction in Low Grade!**TESTIMONIALS.****Indispensable in any Mill!**

Cream City Mills, Milwaukee, Wis., September 9, 1885.

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GENTS: In regard to the Wilcox Tailings Cleaner that we are using on tailings, we take pleasure in
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points. From its peculiar construction it adapts itself to handling tailings superior to anything we
have ever seen. We hope it will have the success a good machine deserves.

Very truly yours,

A. W. CURTIS & CO., Proprietors.
ED. PHILLIPS, Head Miller.

Rochester, Mich., September 11, 1885.

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GENTS: I take pleasure in informing you that I have been running a Wilcox Tailings Cleaner for a
few months, and find it truly to be the "Miller's Friend." It makes more perfect separations than
any other machine in the market, and gets all the Middlings out of the Tailings, reducing low grade
to about two per cent. If I could not get another machine like it I would not sell it for \$1,000.

Yours truly,

W. H. COWDEN.

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The United States Miller



Published by
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Vol. 20, No. 1.

MILWAUKEE, NOVEMBER, 1885.

TERMS: \$1.00 a Year in Advance.
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PRACTICAL POINTS IN MILLING.*

MR. PRESIDENT, MEMBERS OF THE PENNSYLVANIA MILLERS' ASSOCIATION, FRIENDS AND GENTLEMEN:

The world could thrive, were there a few
Great industries forever still;
But what a wall there would ensue,
Were lost each miller and each mill.

Millers produce the flour of the universe. Not the rose of the garden, nor the lily of the field. Not the flower strewn promiscuously along our pathway, emitting its fragrance and shedding its beauty, to cheer and to elevate the human heart; but the flour of the golden grain, "the staff of life," the base of mankind's sustenance, daily satisfying the wants of every rational being. The one is a promoter, the other a supporter of life. The manufacture of flour is thus an industry which furnishes one of the foremost necessities of the human family, a fact which already exhibits the magnitude and importance of the industry's character. It is meet that an association of millers should be engaged in the discussion of so great a life's work, a subject foreign to the cause of milling is properly regarded out of place here.

In the choice of a subject, we did not overlook this fact. The practical points to which we desire to call your attention, appertain to milling solely and particularly, though we have taken the liberty to not designate any branch of the industry, nor any shade of system. Milling, in its widest sense, covers an extensive field, both as an industry and as an art and science; and, fully realizing this fact, we did not wish to confine ourselves to any particular topic, and hence shall make any applications esteemed as useful and instructive.

There is no intention to stigmatize theory, by only touching upon practical points. We wish to say here, that those who regard theory of no utility have not been students of the world's progress. They are not acquainted with the history of the greatest inventions of the day, whose inception has been the result of theoretical experiment. Experience made use of the knowledge thus obtained, and the world wonders at the achievements. But as a body of millers we want nothing doubtful. To learn from practical facts is the quickest and surest way to success. We look for effect. The conflict between systems to us is not the theoretical correctness of one over the other. There is more at stake than mere argumental conquests. Milling is not pursued for fame.

Glory, instead of profits, leaves a blank on the interesting side of the balance sheet. The discerning miller views the system and pursuit of milling from a business standpoint. It is dollars and cents—profits—which are the object of his endeavors. His interest centers in what his trade will most freely buy and most liberally pay for. The vital question to him is: What flour is demanded by my trade?

It matters little to the discriminating miller what his individual preference may be; he realizes that his trade must be satisfied, in order to dispose of his products. The public does not always like what the miller likes; or, in other words, the miller's views and the public's do not, in every instance, coincide. Prominent examples of this kind come to our notice frequently. Here is a miller who is very fond of his own flour. He regards it the very best he ever saw. He extols its virtues in language that is very flattering. It is flour full of the life-giving principle, not all starch, like modern flour. However, his patrons do not appreciate his declarations. They gradually desert him. They disagree, and withhold their patronage.

The public is not easily persuaded in this matter. Even inducements in the way of prices do not effect a much-desired change in taste. Each one clings with tenacity to his choice, often regardless of other considerations. In the land of the free, means permitting, people buy what they want. The dissenting miller expected a reaction in the public sentiment after a prolonged trial of modern flour. He watched and waited. With a serious look, he meant to say that his wayward customers would soon return, and with eagerness call for the "old reliable." This persistent miller is still watching and waiting, and his contemplations have not yet been interrupted by intruding inquirers. The dawn of the day of triumph has not yet appeared, and as time wears on, the prospects are less promising than ever.

We can take a lesson from other manufacturers in this respect. Every one engaged in an industrial pursuit is intent upon producing that quality or grade of goods for which there is a ready sale. Public taste is the miller's standard to which he must conform. If the flour is appreciated it will find purchasers. A sample test of flour, both in the dust and in the dough, is considered insignificant, as compared with the approval of a large and increasing patronage. The progressive miller has committed the rule: A ready sale at market prices is indicative of a good article; no demand at competitive values speaks in evil tones of the quality of the flour. Even should there be a difference of opinion as to

whether that which the public calls good, really is so, this can in no wise affect the policy of manufacturing the flour the public wants. The miller is no hygienist, and there is no mandate, either moral or legal, that makes it obligatory upon him to manufacture the goods he deems the best for the public health. True it is, that no one can conscientiously manufacture a flour which he knows will be positively ruinous to the health of every consumer; but if each miller would be compelled to mill that which he regards the best food for the human family, some of our best millers would be under obligations to forsake wheat flour milling entirely, and to manufacture Graham flour; others, rye flour; others oat meal; and others, corn meal. No code of ethics contains such a rule, and none can, and prove its correctness. To give the trade what it wants is the course to be followed by every shrewd and intelligent miller, because he knows he can thus maintain a demand for his product.

And, without digressing, permit us to say, that although public taste is not always in the right relative to flour, it is, at the present time, supported by scientific research. Modern flour is, without doubt, the most genuine article ever produced—tainted with less impurity and foreign substance, and lacking fewer of the original constituent elements of the albumen. The consumer tests the bread to judge of the flour, and it must be conceded that he is testing the flour in a manner that is most intelligible to him, or to any one else. Logically and practically, the best bread, other things being equal, is made from the best flour. In other words, the farinaceous portion of the wheat having been reduced to a form and condition in which its every original quality is susceptible of the highest development in bread, will demand natural methods and treatment, and must yield the best bread with proper handling. Modern flour, for which the greatest demand exists, comes nearest to this definition of the best flour, as has been demonstrated by actual practice.

Having come to a knowledge of the flour his trade wants, the miller is next concerned how to manufacture the desired flour. His anxiety is expressed in the question:

Which system of milling will most economically produce the flour that is in request?

If we recur to the past, we find that each system of milling had its time in which it flourished. As long as older methods competed with newer processes in the quality and quantity of flour, there was no change of sentiment and no advance in milling recorded. However, just as soon as novel features were

* A paper read before the Pennsylvania Millers' Association, at Bethlehem, Pa., by Mr. Harry S. Klingler.

introduced which improved the quality of the mill's product, the era of development and progress became visible. Low milling lost none of its advocates until half-high milling demonstrated, beyond doubt, the superiority of its work. To-day half-high milling has lost its prestige, because high milling is giving better results. Irrespective of the prejudices of individual millers, gradual reduction is the accepted system of milling, furnishing the flour for which the greatest demand exists at the present time. The older systems are not extinct, but they do not produce the flour which is publicly recognized as the leading flour, and for which there is an universal inquiry. It matters little what the success, as to the quality of the flour, may be, of individual mills competing with each other; the product of the mills taken collectively, decides the question of superiority to every fair-minded seeker after the truth. Some may say that there are yet large quantities of the new process flour sold upon the market, and that there still exists a quiet but steady demand for this flour. Though this is true, it is equally true that the bulk of new process flour is sold at a concession in price, and that this trade is retained solely by the cheapness of the article. "Facts are stubborn things," and the facts are before our very eyes, that gradual reduction produces the flour which enjoys the largest demand at the highest price.

Inasmuch as gradual reduction has been practiced by different methods, the miller is rightfully desirous of knowing how to pursue this system the most economically. History combines the experience of the whole industry, and we have thus a fertile field from which to gather facts to guide and guard us in our judgment. Let us briefly rehearse the introduction of the gradual reduction system. In the past few years, the various devices which have been employed in the new system have been thoroughly tested. As soon as it became known that a gradual mode of reduction gave the best results, untiring efforts were made to adapt the burr to the new departure. Very few millers, who were the pioneers and heroes in the milling revolution, did not cling to the burr, and labor with devoted interest to accomplish the breaks upon the burr, or at least some of them. All plans failed, and the universal verdict was that the millstone was not adaptable to the uses of reduction in the break operations. The result of all the trials was that the burr was forthwith displaced as a break device, and was retained in some mills for the reduction only of purified middlings. To-day the millstone is yet largely used in hard spring wheat localities, and seems to succeed admirably in maintaining a reputation for grinding hard spring wheat middlings. In winter wheat districts, however, especially where soft wheat abounds, the tendency is apparently to discard the burr entirely. Mills which have for years adhered to the millstone for grinding clean middlings, are, one by one removing their burrs; this change of sentiment coming gradually after due deliberation and experience. Not only the burr, but other reduction devices failed in carrying out the aim of gradual disintegration. Reduction devices of various kinds were invented, and were tested in actual practice. They one and all failed, with the exception of rolls. Though there are reduction machines of more or less merit, in use on the first break,

all subsequent operations in our best soft winter wheat mills are performed upon rolls. Gradual reduction has been developed by rolls to its present high standard. The facts to which reference has been had, can be verified by a personal examination of the best mills of the day. An unbiased decision can not otherwise than accord to roller milling the honor belonging to that system of milling which is to-day producing most economically the flour that is in request.

The miller, having satisfied himself as to the flour his trade wants, and the system of milling capable of producing that flour, is confronted by the all-absorbing and everyday question: "What are you going to do about it?"

You will concur with our opinion that this is the most difficult question of all. The others that were answered were put in a general way, and the answer could be gathered from general facts. This question is directed to each miller individually, and has special reference to his peculiar circumstances. How diversified the wants, facilities, and abilities of different millers! One has, or wants, a large mill; another has, or wants, a small mill. One is situated in the city, with excellent railroad facilities and local trade; the other, in the country, away from railroad communication, and confined exclusively to a custom trade. One has large available resources, the other is limited in his finances. So each one must be governed by attending circumstances. You, no doubt, expect us to answer this question by the advice,—every one build a full-fledged, genuine roller-mill. Though this advice would be proper, in order to place one in a position to manufacture popular flour, you will observe that the question has not been considered, whether such a project would prove a commercial success. The general elements of success would be present, but whether the local elements are assured, left entirely out of view. Telegraphy and railroading are a success as a system and an art, but the indiscriminate building of railroad and telegraph lines has, by no means, always been a business success. The quality of the flour depends upon the mechanical ability of the mill and the miller; the profits depend upon the commercial facilities of the mill and miller. Mechanical success can be achieved without commercial facilities and without commercial success, but then it would be valueless. We build mills to make them pay, not merely to demonstrate that a system of milling can produce a certain grade of flour. The question is fully answered as follows: Consistent with your ability and facilities, build, or remodel your mill to the system which will most economically produce the flour for which there is the largest demand. This rule can be adapted to the peculiar wants of each individual miller. It will be applicable to every one, though each one must use his own judgment in measuring his ability and facilities. It is a formula which will insure success, if success is dependent upon the miller's progress in reference to the improvements of his mill.

A citation of millers diversely situated, will permit an explanation in detail. In considering individual circumstances, individual preferences and prejudices must not be allowed to hide the fact established, that a genuine roller mill will manufacture the

most popular flour, commanding the largest and most lucrative trade. With the best equipped roller mill, then, as the ideal mill, we will proceed to examine the various millers in different locations. Our first subject is a would-be-mill owner of means, resident in a city or town, where there is a good local trade and excellent railroad facilities. Without hesitation, you answer, let him build a modern roller mill of the best type. Right! Next! Our next applicant is a miller who has a millstone mill in a thriving place, but his mill is idle half the time, and his flour is selling at a sacrifice. At the same time, the market is overstocked with the best of roller flour, and the latter is selling at hardly living prices. Furthermore, this unfortunate miller is still more unfortunate in not possessing any capital. He is certainly in a sorry predicament. He is not making anything now. If he mortgages his mill and puts in rolls, he will not make anything either, and probably fail entirely. Taking him into our confidence—by way of digression—we would whisper into his ear, sell your mill to an enthusiastic burr advocate. A twofold good would be accomplished,—an honest miller rescued from a perilous position, and a persistent miller given a graceful opportunity to reform. But, as regards the former's actions in the direction of improvements, this is no answer. He recognizes that a roller mill is the mill with which he can compete in the market; or, if he does not recognize this fact, it is true just the same. Let him keep in view the ideal mill of the day. Let him make the improvements his purse will permit, but let him make them in such a manner that the more he makes, the nearer he approaches the system which can manufacture the desirable flour. His every addition and change must be a step nearer to a complete roller mill; and the more steps he makes, the more capacitated, as a natural consequence, he will be, to cope with those who lead the trade. It will not do to let the mill stand unimproved, because it cannot be thoroughly overhauled. To stand still now, means to go back. Every little improvement, judiciously made, will enhance the value of the mill, and the value of the output. From a commercial point of view, it is infinitely better to make an effort to operate the mill by gradual and continued improvement, even if the profits are absorbed by the expenses, than to despair, and leave the mill idle, and thus not self-sustaining. In the one case, in the lapse of years, there are no profits and a depreciated property; in the other case, there are no profits either, but there is a remodeled and productive mill. Because this miller cannot make a complete roller mill out of his burr mill at once, should not lead him to think that he can never, by gradual addition, come to a first-class and approximately perfect plant. Let him do what he can safely, but let him do it well. Who has not learned the words of the poet, and realized their truthfulness, in the affairs of every day life?—

"Little drops of water,
Little grains of sand,
Make the mighty ocean,
And the beauteous land."

Not a word of encouragement have we to say to those who expect a machine or two to fit them out for successful competition with the best equipped mills. They will be sadly dis-

(CONTINUED ON PAGE 14.)

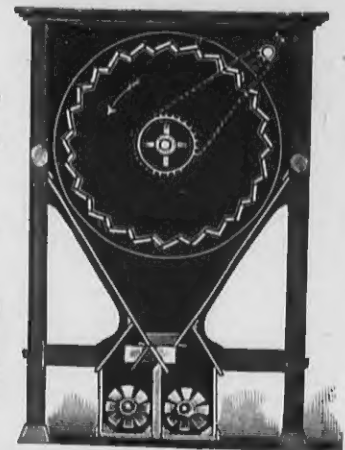
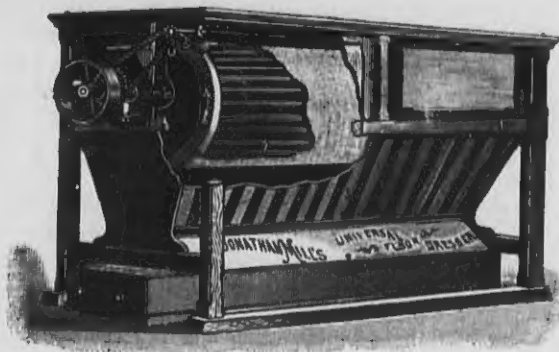
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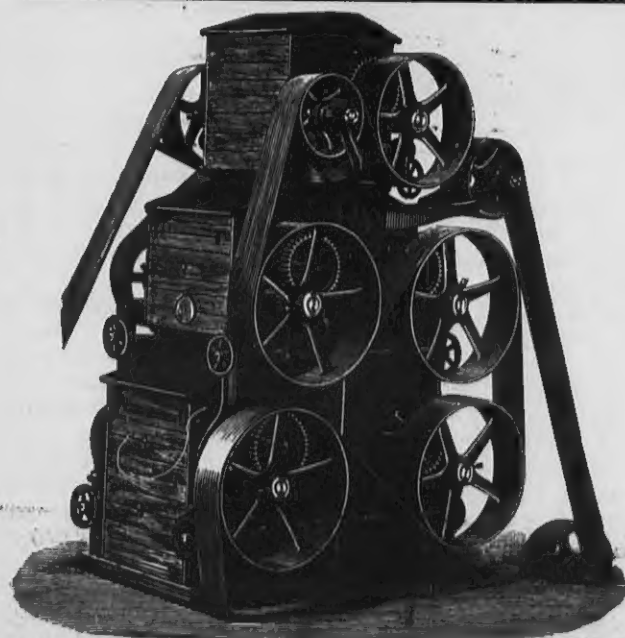
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A practical test of over two years proves that these Mills require less power and make more Middlings and less Break Flour than any other Roll in the market.

They are mounted on a strong Iron Frame, and the mechanism is compact, simple and easily adjusted. The accompanying cut shows our Five-Break Mill. Our Three-Break Mill is also giving the best of satisfaction.

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THE WILCOX TAILINGS CLEANER.

Carefully patterned after the models of experienced millers, the WILCOX TAILINGS CLEANER is now on the market and is so successful under the test of practical working that it leaps at once into the ranks of the first-class standard machines of the day. It is claimed that by its use all the "Patent" can be drawn from the tailings, thus reducing the low grade to a minimum. It has very large capacity, is noiseless, does not shake, and requires comparatively little power. It is durable, with no liability to choke, the heavier the blast the cleaner the middlings, a strong blast not reducing the sifting capacity nor enriching the tailings. No cloth cleaners are required, the piling up of stock is unknown, while it requires no more attention than is needed to regulate air blasts. For enumeration of other good points, and detailed information, write the Cockle Separator Manufacturing Co., sole makers, Milwaukee, Wis.

A GERMAN MODEL MILL.

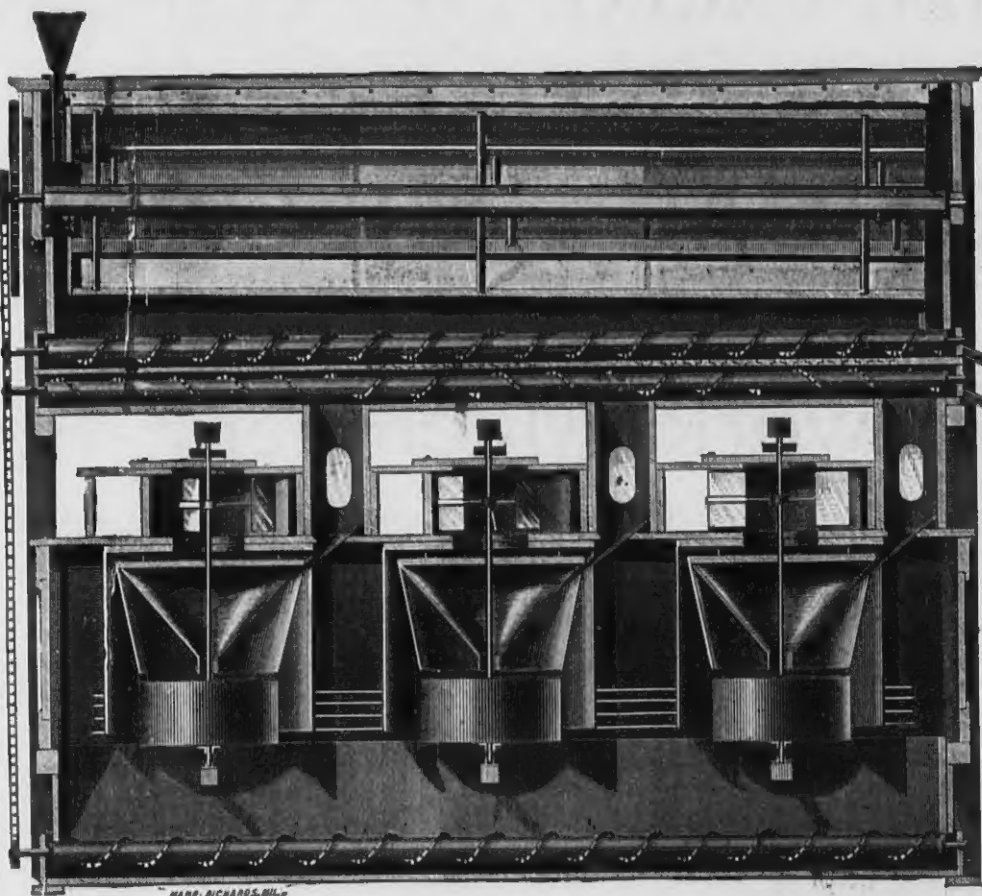
A plan for a model mill of 112 barrels daily capacity is proposed by Frederick Haake, a mill-building expert of Berlin, as follows:

It will be understood that the mill-building has been constructed in the best possible manner with regard to strength, light, room, transmission, etc., and that a compound condensing engine is to furnish power. Grain is taken in at the basement, weighed and elevated to the top story. From the bins here it is removed to the weighing and cleaning machinery, as may be required, by suitable conveyors and elevators. For cleaning, it goes first to an aspirator with sieve mechanism, thence through two trieurs to an ending stone. It is then elevated to the ending cylinder, passing afterward to a Eureka machine, and finally to a brush machine. After cleaning it is sent by elevator to the automatic scale, to show the weight lost in the process. From here it goes to a bin over the crushing or splitting rolls, and after passing through magnet apparatus reaches the preliminary splitting process. It then passes to a cylinder which removes the smut, and drops into an elevator which takes it to the last of these conveyors located behind the reels. By this it is carried to a bin over the grinding machinery. These bins or hoppers are in all cases double for greater convenience in returning material. The mill goods goes now to the break rolls for the first time, thence to a cooling apparatus and to the

elevator which lifts it to the proper bolt. The break flour is here separated and sacked on the flour floor beneath the reels. The middlings fall from one of the three conveyors and go to the middlings purifiers. What remains after bolting may be sent back to the break mill and the operation repeated as often as high milling processes require or it may go at once to the reducing rolls and there have the processes of reducing and bolting repeated as may be needful. In this way the process may be varied as much or as little as desired, an excellent result attributable to this special arrangement of the machinery. Conveyed to the purifier, the middlings are elevated on a middlings grader which divides them according to size, and then pass into corresponding bins below. Every two or three of these bins have a suitable purifier, situated underneath them. The dressed middlings is carried upon the passenger elevator to the hoppers over the

remaining from the cleaning machinery should be treated by the ending stone and cylinder and mixed with the bran, the latter operation being best performed by sending it through the bran conveyors. The excellence of this outfit consists in the fact that the miller is independent of a set programme, and can vary his work as local circumstances, grain to be used and custom demand.

A TRADE-TEACHING SCHOOL.—A trade school is in successful operation in New York city. It was founded in 1881 by Col. R. T. Auchmuty, an architect of that city. In this school are now taught plumbing, plastering, brick-laying, stone-cutting, pattern-making, carpentry, wood-carving and fresco-painting. This institution is intended partly to take the place of the apprentice system, affording intelligent instruction and practical experience in the handling of tools, at a nominal cost to young men. The old apprentice system, through the opposition of trades unions, and from other causes, has to a considerable extent fallen into disuse in the United States. The thoroughness of the apprentice system in Europe is practically unknown here, and unless something is done, and speedily, to counteract the growing tendency towards laxness, we shall soon be obliged to rely for skilled labor in the mechanic arts, on importations of foreign workmen. The undertaking of Col. Auchmuty appears to be a step in the right direction. Its success thus far has given good grounds for believing that it will continue to grow in usefulness, and that eventually the system will be extended to other sections. The development of this enterprise will be watched with interest by all

**THE WILCOX TAILINGS CLEANER.**

porcelain rolls. Being reduced on them, it is elevated to the proper reels, where flour is taken out, and the remainder goes either as tailings to stones, or as middlings to the purifier, to be dressed and sent again to the porcelain rolls. This process is continued until all is reduced to tailings and those to flour. In a similar manner the material remaining after action of the purifiers is, according to the miller's judgment, worked down to flour and bran. As the milling mechanism takes only about one-third of the room available, the remaining space can be largely utilized for flour mixing and flour storing purposes, if desirable. Thus the first, second and third stories may have flour bins, and the basement storage for bran, whence it may be conducted by pipes from the upper conveyors, sacked and stored. The refuse

persons engaged in industrial pursuits—by the manufacturer no less than by the workman.

PASTE THAT WILL KEEP.—Dissolve a teaspoonful of alum in a quart of water. When cold, stir in flour, to give it the consistency of thick cream, being particular to beat up all the lumps. Stir in as much powdered rosin as will lie on a dime, and throw in half a dozen cloves, to give it a pleasant odor. Have on the fire a teacup of boiling water; pour the flour mixture into it, stirring well all the time. In a few minutes it will be of the consistency of treacle. Pour it into an earthen or china vessel, let it cool, lay a cover on, and put in a cool place. When needed for use take out a portion and soften it with warm water.

INVENTORS SHOULD STUDY TECHNICALITIES.

Inventors as a class, do not study the laws of mechanics systematically.

It is frequently amusing to see the complication of cogs, ratchets and wheels found in machines which have but a simple duty to perform.

Those who have studied machinery, and have contributed inventions, can best appreciate how much more simple they can arrange the movements for performing a given duty, after they have had several years of practice.

Practice is but another name for education, and why not substitute much of the time spent blundering around in the dark, without the light of knowledge, for good books containing the results of the practice of other men in whatever art or science you desire to study.

It is much easier to read in a book and thoroughly understand, too, the best principles upon which epicycloidal cog gearing is constructed, than it is to rediscover those principles, and this you would have to do, or find an equivalent, before you could possibly make a success in this line.

For another instance, the study of calorifics as applied to the development of power in an ordinary steam engine. Thousands of engines are running in this country, every day, wast-

ing unnecessary quantities of fuel, veritable clap traps in every particular, the result of the difference between what some engine builders actually know and what they ought to know.

Young men who have a life time before them, without the means to take a regular technical course, can find in any good library every principle that is necessary to make a systematic beginning. Special books can then be bought or borrowed, and in addition scientific papers and periodicals can be obtained by any one, if he will exert himself with a fixed determination to be somebody, and not be an "it" in the world's great work.

Life is a serious matter, and those who have health and strength should be certain that not a day passes without they have learned something new that is of real value to add to their stock of good things, which, probably, some day they will ask the world to buy, when quality will be considered rather than quantity. So, then, young inventor, young mechanic, if you have been exercising your mind only upon the pictures of hope, you must

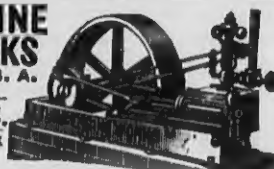
"—Be up and doing,
With a heart for any fate,
Still achieving, still pursuing,
Learn to labor and to wait."

—American Inventor.

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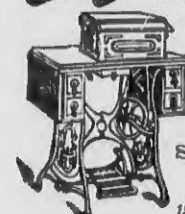
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MILWAUKEE, NOVEMBER, 1885.

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GRAND OPERA HOUSE.—Performances every evening, and Wednesday, Saturday and Sunday matinees.

DIME MUSEUM—Performances every hour from 1 P. M. to 10 P. M. every day.

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THE *Journal of Railway Appliances*, New York, which has heretofore been published semi-monthly, will hereafter be published weekly, the subscription price remaining the same.

We are informed that all litigation between the Case Manufacturing Co. of Columbus, O., and the Consolidated Middlings Purifier Co., of Jackson, Mich., in respect to purifiers, has been brought to a satisfactory termination by compromise, the Case Co. being fully licensed to carry on the manufacture of their purifiers.

MILWAUKEE NOTES.

Mr. Henry Smith, of the firm of Birge & Smith, has just got out plans for a 375,000 bushel elevator for the Jos. Schlitz Brewing Co. The building will be erected as soon as possible. The Edward Sanderson elevator, for which Birge & Smith also made plans, is rapidly approaching completion. It will have a capacity of 200,000 bushels. Birge & Smith are doing a prosperous business in millwrighting for flouring mills, breweries, maltheuses, etc., all through the Northwest.

The old Dutch windmill in Williamsburg, a suburb of Milwaukee was totally destroyed by fire early on the morning of Oct. 5. The mill belonged to John Joederman. The total loss is estimated at \$5,000, and the insurance is \$2,500. The property destroyed consisted of the windmill, grocery store, flour and feed store, and barn. The mill was one of the old landmarks of the city and has been a favorite object for sketching by artists.

WE have the pleasure to announce that we will issue Cawker's American Flour Mill, and Mill Furnishers Directory for 1886 about Feb. 1, 1886. We desire all who wish copies to send in their orders now, as only a very limited edition will be printed. The work will be issued in first-class style, and the publisher will use his best endeavors to make it perfect. All communications in reference to it should be addressed to E. Harrison Cawker, publisher UNITED STATES MILLER, Milwaukee, Wis.

I SOMETIMES think, when I see a man that has drawn his week's wages on a Saturday night, borrow a dollar of a fellow-workman Monday noon; or when I see a \$9 a week clerk rush into a base ball pool room every day on his way to lunch, or when I see a girl of good family handkerchief flirting with a dude, or when I see a man subscribe handsomely to charities by which he will get his name in print while his own family are wanting the comforts of life; or when I see a woman of forty-five apeing the manners of a school-girl of fifteen; or when I see a man go to church on Sunday and scheme to cheat his fellow-men the other six days in the week; or when I see a man trying to do business without advertising, that there are a great many fools left in the world yet.

C.

LET THERE BE LIGHT.

In all manufacturing institutions where much machinery is used, and especially in flouring mills, the windows should be so arranged as to give plenty of light in the day

time and the artificial lights, at night. In a well lighted mill dirt is not apt to accumulate, slight repairs to be neglected or accidents to happen. Rats and mice love darkness rather than light and will not become an unbearable nuisance in a light and clean mill. Thorough coats of whitewash applied once, or better still, twice a year, will add greatly to the light, cleanliness and healthfulness of the mill, and will tend, to a certain degree, to prevent the rapid spread of fire. Attention to this matter will be well worth the expense incurred in many a mill we have seen.

A PLAN TO CHEAPEN PATENTS.

An inventor of this city has presented to the Secretary of the Interior, the Commissioner of Patents and the President an elaborate paper and argument in favor of dollar patent rights the same as dollar copyrights, thus placing the inventors and authors on an equality, and he asks that in the annual reports of the Secretary and Commissioner, as also the annual message of the President, that this plan may at least be presented for consideration to Congress. In the reduction of postage to two cents the Postmaster-General reported, he says, strongly against it, but President Arthur, in his annual message to Congress having strongly advocated the reduction, it was passed, and no act of the last President will redound to his credit more than this. He claims that if President Cleveland and his administration will take like action in favor of dollar patents in place of \$5 fees as now, it will redound to his and their credit infinitely more than in the case of the two cent postage.

Under the proposed plan for dollar patents the inventor is to send a written description of his or her invention, either with or without a drawing, with \$1, to the Patent Office. It is there to be numbered and filed, and without any examination as to priority, as in all of the European governments, a blank printed patent is to be filled in as now with the name of the inventor and invention, the number of the description on file, and having the fac-simile of the Commissioner of Patents printed thereon, is to be sent to the inventor in about one week from its receipt, as is now done with copyrights, in place of nearly a year as now, at a cost of \$75 for office fees and agent. As not more than one in two hundred patents is ever introduced under this plan the one hundred and ninety-nine generally poor inventors will have only lost \$1 each, while if it is introduced and becomes valuable and is claimed by several inventors, as is always the case even under the present costly examination and agents, the rightful owner is to be determined by the courts as now.—*New York Herald*.

SAM LAUGHLIN, in his latest grain and provision review, writes as follows:

Farmers are everywhere holding their wheat for higher prices. The flour mills have started up and show considerable anxiety about getting their supplies. The milling situation has changed from extreme dullness to one of great activity, and millers south and east are competing freely with those of the northwest for suitable grades of wheat; the result is, the great crowd of grain-buyers, millers and elevator men throughout the west have suddenly turned bullish, and prices have

been advanced 10c per bushel in as many days. This is the situation at home; how is it abroad? The imports into Great Britain are light, being under the weekly requirements, yet the amount on passage to Europe has decreased 1,280,000 bushels for the week; and since the 9th of May, when it reached its maximum of 29,560,000 bushels, it has decreased 17,520,000 bushels, (being equal to nearly the whole stock of Chicago and New York), the amount afloat for the United Kingdom being only 11,000,000 bushels, or less than four weeks' average imports; and this is all that can possibly reach them during the next four weeks, excepting Russian or Atlantic port shipments. The question is, Where are they going to get the balance of their supplies? You may say from California, Australia and India, but we answer, supposing those countries had unlimited supplies, shipments made now do not reach Europe until February; hence after exhausting the four weeks' supply now on passage, they must either depend on their own supplies or call on us; particularly as the Baltic will soon be closed by ice and the Russian Black Sea ports have little or nothing to spare.

THE BREADSTUFFS EXPORT TRADE.

The character of our export trade in breadstuffs, the *Chicago Tribune* says, has changed materially within the last few years, from the operation of internal causes as well as external ones. The growth of the milling interest renders it each year more difficult to sell wheat in the berry for export, as the flour is offered at a cheaper rate, notwithstanding the fact that mill offal commands a high price in the British Isles for feeding to live stock. For this reason the absence of an export demand for wheat is a much less powerful argument in favor of lower prices here than it used to be. If the flour be wanted abroad, or even if it be taken in response to an urgent offering of the property, our surplus is in process of diminution just as much as if the equivalent in grain were exported. This appears to have been the case recently. The millers of this country have been active, and the indications are that a great deal of their manufacture is for shipment abroad, while it is intimated by certain parties here that they (the millers) keep the fact as quiet as possible because they have to buy the wheat and do not want to give sellers a pretext for demanding higher prices for the grain. In such a case as this our visible supply becomes the reserve of a reserve, and all the more permanent in its stay in store because it is not likely to be drawn upon till the general stock of the country has evidently become a scanty one.

The *Alta Californian* states that the recent large receipts of Oregon wheat at San Francisco, with the report that a large quantity will follow, have made millers more independent of wheat holders in that State and checked local business. It is estimated that there will be upward of 17,000,000 bushels of Oregon wheat this year. It is expected that 3,500,000 bushels will be retained, leaving the balance for export and to come to San Francisco, where arrangements for storage have been already made. The freight by steamer here is stated to be less than the difference between freight rates to the United Kingdom from Astoria and San Francisco.

THE ART OF MILL BUILDING.*

Mr. President and Members of the Pennsylvania Millers' State Association:

It may or may not have occurred to some among you to question why I have selected as my topic the art of mill building rather than the kindred art of milling. In fact, I am somewhat at a loss myself to accurately define wherein the distinction lies. If I am correct in my argument, the former is of wider scope, and includes the latter, so that, if intelligently treated, it will cover not only the entire field of practical milling, but something more and beyond. And when I take into consideration the numerous milling papers devoted to the art of milling, and the volumes of correspondence on milling matters, I am doubtful of my ability to add anything new and of interest to the already existing stock of milling knowledge, and prefer talking about something which is new at least in name, even if I can do no more than thresh over the same old straw without gaining a single additional kernel. In this respect I am fain to hope that you will judge me less critically than I am disposed to regard myself, and that even if I tritely cover the same old ground, I may do it in such a manner as to interest, if it does not profit you.

You may ask wherein the art of mill building differs from that of milling. My idea is that it is not only wider in scope, but is also more practical and deals less in theories. It is moreover something in which there are two parties interested; the man who builds as well as he who operates the mill. It is unfortunately the case that the pecuniary interests of these parties are often widely and unwarrantably opposed, and each party is prone to study the art from his own standpoint. The miller has to deal chiefly with results, and his conclusions are biased by complications of questions arising from matters entirely beyond and outside of the sphere of the builder's art. Such are questions of wheat supply and market for the mills' product location, transportation facilities, freight rates and other like matters pertaining to the commercial management of the mill, which can be discussed intelligently only by men practically versed in the business management of flouring mills. The builder on the other hand has to deal with mechanical problems, and to consider the means to be employed as well as the end to be attained. In one thing both parties meet on common ground, and that is the results or work which the mill is intended to produce. The miller considers the mill as a whole, a complete machine which is the most important of the tools used in his business; the builder is forced to consider it in detail, scrutinize its component parts, and combine them in a harmonious whole. Both are alike interested in the common end to be attained, but to one it is the end to be reached and to the other it is only the starting point. The inter-dependence of the two is such that it is impossible to separate them, and I trust that while you will excuse me for looking at the subject from the builder's point of view, you will also pardon me if I overstep this

limit and trench on matters which you may deem wholly within the millers' province.

I have said that mill building was a practical art. I doubt, however, that theory has any better place in the operating than in the building of the mill. Not that theory is in itself necessarily wrong, only when it is divorced from fact and becomes purely speculative. Neither builder nor miller can flit to shy of theories which are advanced to sell some special machine or machines which are designed to fit some special theory. One of the quaint philosophers of olden time bequeathed to posterity a curious volume entitled the "Vanity of Arts," and though he does not mention the arts of building, and milling among the number, I am certain that had he lived in our day he could have made up a telling chapter by reviewing the numerous theories and systems which millers have paid for and then exploded during the past few years. In fact, I do not doubt that many of your number, when confronted with the seeming necessity for improvement, have inwardly protested and questioned whether it was not useless, and the results obtained by this lavish expenditure of time and money only a vanity. We laugh at the "old fogies" as we term those who are still the "slaves of the buhr," at the same time secretly wishing that they were in the right, and hoping that they can demonstrate the correctness of their views. This is, unfortunately or not, as we may look at it, an intensely practical age, and no amount of theorizing can alter the fact that the mill must attain to actual practical results in order that its operation may be commercially successful. Men will not buy flour simply because it is made on an elaborate system, the outcome of a finely developed theory. Neither will they eat bread made of stone-ground flour, because the miller insists that it is better than that made by newer and more costly methods. Tastes change, and it is incumbent upon the miller to change his methods, and cater to his customers. It is here that the peculiar province of the mill builder lies, for he must devise ways and means for manufacturing the product desired, and no matter whether he theorizes or not, his work has to be tried by severally practical tests. Failing in this, no matter how plausible his theory, he will find no customers, and must soon drop out of the field altogether. The path of milling progress during the past decade is liberally scattered with the wrecks of theoretical milling systems, and the commercial history of American milling is still more thickly strown with the financial wrecks of millers who have pinned their faith in these systems, or who have built after theories of their own. Milling as a trade is full of fascination to the miller who follows it intelligently and studiously. As one of the leading millers of Minnesota long since expressed himself to me in a conversation on milling topics: "Milling has a charm, because it is full of possibilities, and because the limit of perfection has not yet and possibly never will be reached." This is undoubtedly true, but the miller must bear in mind that there is no royal road to success, and that the only theories that are valuable are those which are based upon solid facts demonstrated to be such by actual practice. Not long since every man who was successful in obtaining a patent on a first break machine or a cleaning ma-

*A paper read before the Pennsylvania Millers' Association at Bethlehem, Pa., Oct. 13, by Mr. Albert Hopkin, of Milwaukee, Wis.

chine, felt himself competent to design and build a flouring mill. Nothing was necessary but a name to his system, and if he was a ready talker he did not lack customers. We have all seen the rise and fall of the "Mills" system, the "Gratiot" system, the "Jones" system, and others of like kind. The trouble with all of these was not that the individual machine was wholly worthless, but that the theories of the inventors precluded their seeing clearly that their so-called systems stopped short with their respective machines, and that when they came to the consecutive operation of the complicated machinery of the mill they had no "system," where a carefully devised system was imperatively essential to success. In mill building, an ounce of experience is worth a pound of theory, and whether the builder's theories of six inch rolls or centrifugal reels are correct or not, they cannot be a warrant that he can build a successful mill. In this as in other things, the best earnest of a man's ability to perform, is what he has done in the past. When it comes to theory vs. practice in mill building, practice will win every time.

Both miller and mill builder have a much more difficult "row to hoe" now than in years gone by. Their conditions have been relatively reversed, and whereas formerly the miller designed the mill and was engineer and architect as well as operative miller, the millwright merely carrying out his plans, the latter is now designer and builder and of necessity a great deal of a miller, the miller merely carrying out his plans. Do not understand me as saying that either is the more subordinate position, but rather that the constructive department has changed hands. As milling methods have become more complicated and a more intricate system of machinery has come into use, the natural result has been a subdivision of labor, though unfortunately for the mill-builder there has been no corresponding division of responsibility, and he is now obliged to guarantee not only the mechanical operation of the mill, but its ability to produce certain results as well.

"Forever on life's dial-plate
The shade is backward cast."

And we must not wonder if the mill builder and the miller likewise look back with feelings akin to regret to the good old times of simple methods and less exacting requirements. Especially may the builder be pardoned for wishing himself once more simply a mill furnisher, and when the problems of wheat cleaning, stone dressing, grinding and bolting were left almost if not entirely to the millers for solution.

Whoever has read the life and strange surprising adventures of Robinson Crusoe will remember that when he had discovered the few grains of barley which gave promise of future well-filled granaries, he was at once filled with perplexity as to how to build the mill necessary to the "gradual reduction" of his harvests to a condition suitable for bread making purposes. History repeats the fiction in this case, and in our country wherever the farmer has gathered the harvest the miller has followed with the mill. To-day the miller's perplexities, like those of the wrecked mariner, find expression in "What kind of a mill shall I build?" though the query arises not from a paucity, but from an abundance of material from which to make

selection. On the whole I am not so sure that Crusoe was not the more to be envied, for while he had to search long for the proper materials of which to construct his mortar and pestle, and expend much time and labor in fashioning them for their destined purpose, he was not in the meanwhile "drummed" to death by salesmen of mill machinery, or bewildered by the contradictory arguments of competing mill-building firms. Moreover he was not going to engage in milling for the export trade, and had no fear of his home customers throwing his flour back on his hands. He was not kept awake nights by patent litigation, and did not have the mortification of seeing grists go by his door to his more enterprising neighbor while he was debating the relative merits of sandstone and lignum vitae as a material for the mortar, or theorizing over the comparative advantages of sharp and dull corners on the pestle. Taken altogether Crusoe's lot as a miller was not a particularly unhappy one when compared with that of the miller of the present day, who, when he is about to build a mill, has to decide not only where he shall build, how large a mill to build and where he will get his wheat supply, and find a market for his products, but also what kind of a mill to build, what machinery to adopt and what system to follow. The first three of these questions it is the particular province of the miller to answer. They belong, if I may so express it, to the commercial end of the miller's business, and I do not see that the mill builder can be of much assistance except in a general way, in determining their answer. The last three, however, are peculiarly within the domain of the mill builder, and as he is now held responsible for the results the mill will produce when built, it is no more than right that in deciding these points, his opinions should have special attention, and most careful consideration.

It is not my present purpose, in considering the art of mill building, to answer these questions specifically or even generally. To do the former would be impossible unless individual conditions were given, and these individual conditions vary so exceedingly that a general answer is impossible. Neither am I here, as from my present business relations you may possibly imagine, to advocate any particular line of machinery, or champion any particular system of milling. I am frank to confess that my occupation during the few years past, had led me to study mill building from the builder's side of the fence, but I am not so prejudiced that, while having my own preferences for certain machinery and methods, I cannot extend the term mill builder to cover more than one particular firm or embrace a competitor in business. I believe it should be the aim of every mill builder to build as perfect a mill as possible, as I know it is the desire of each individual miller to have his mill, when completed, the most perfect that can possibly be built; and while the latter often falls short of his ambition and the former fails to reach the goal set for him by the miller, it is still true that both desire to reach practically the same result, and should aid each other in reaching it. This is not always the case, and the miller is often grossly unjust to the mill builder, not only in exacting unreasonable guaranties, as to results to be obtained, but also by hampering the builder by conditions of amount and kind of machinery to be employed, and extent of

the investment. Frequently when asking a miller what kind of a mill he wished to build, I have been answered: "One which will compete in quality and yield with the best mill in the country." This is a very laudable ambition, and one which any mill builder would be glad to attempt to gratify, but it is rarely, if indeed ever, that the miller in so stating the result desired takes into account what its fulfillment would require, and how much study and expense on the part of the builder would be required to literally accomplish what is asked. No mill builder with whom I am acquainted will deny the possibility of his being able to do better work, and build a better mill than he has yet built, if allowed unlimited facilities and means to that end. Few will be foolish enough to guarantee to equal the best work done in any mill in the country, unless allowed to use equivalent machinery, and if so foolish will most invariably be the pecuniary losers thereby. Most frequently the condition as to the superlative excellence of the mill when finished, is coupled with one that it shall not cost to exceed a specified amount, or more generally the work is let by contract to the lowest bidder. I know of nothing which more than this last, tends to hinder the advancement of the art of mill building, or to lower the standard of workmanship in American mills. It may be so in other parts of the world also, but here I know that the practice is injurious both to millers and builders, and I believe it will be found true without exception that the best mills in this country are those that have not been built under such conditions, but those where the work has been intrusted to competent firms and a fair price paid them for their work. It may be argued, why not build a mill by contract as well as a bridge, a house, or any public building? The reply is simply that the conditions are entirely dissimilar. When mill building reaches that stage where mill owners will employ competent and practical engineers to make plans, prepare specifications, and superintend the work as architects plan, specify, and superintend the erection of their work, then we may look for better mills to be built under contract, and even then I believe that better work will be done "by the day," the miller buying his material, and hiring his labor, just as now it is generally remarked that houses built in this way are better constructed than those built by contract. To the objection that such work costs more, the answer is, it is worth more when done, by all the difference in cost. Mill building is, however, far from having reached the state where competing bidders are held down to bidding on the same or even similar plans and specifications. Generally the only thing the miller specifies is the capacity desired, and in comparing bids the guarantee is given more weight than the reputation of the firm making it; and if a comparison of the machinery is made, it is without any reference to the system intended to be followed. The natural result is that the best and most experienced builders are forced to figure on building not the best mill they know how to build, but to build as cheap a one as will possibly answer the purpose. The time will probably come when the majority of millers will consider the character and quality of the machinery used as of at least equal importance with the guarantee, and when the system of the mill will be given more weight

than either, but at present there is little incentive to the mill builder to improve on his past work. I do not consider that mill owners are wholly responsible for all the poor work that has been done in our mills during the past few years. The mill builders are largely at fault in that their desire to excel their competitors in the amount of work being done, has led them to cheapen the quality of their work. The question has been mainly not how good, but how cheap the work could be done. This reckless competition has had one good effect, however, for it has forced those builders, who sailed into a large trade during the flush times two or three years since, with little milling knowledge and still less experience, to retire permanently from the field. The millers have been largely the gainers by this, as there are fewer wild theories afloat, and fewer experiments made in their mills.

The art of mill building, like all other industrial arts, and, like all human knowledge, grows or advances only as new facts are brought to light and demonstrated to be facts. I do not believe in trade secrets, and while I know that millers and mill builders alike are not very much inclined to give away the information which they have gained, or impart the facts which they have gained to others, except in the direct line of business, "for a valuable consideration," I think the time is coming when there will be the same free interchange of opinion among millers and milling engineers that now takes place between engineers and expert workmen in other lines of industry. In fact, during my twelve years' acquaintance with the millers and mill-furnishers of this country, I can notice that a marked improvement in this direction has taken place. It is not so hard now to get men to tell what they really know about milling matters, though still the amount told, which is not known for fact, would make much the larger volume. It is because of the disinclination among millers to impart information and to accept it from others, that so few millers are really competent to lay out the system for a mill and insure its doing good work from the start. I know I have been taken to task several times by self-constituted champions of the "dusties" for calling the attention of millers to this fact. But it is a fact. Under the old style of milling, the miller laid out the chart and directed the sequence of the mill's operation. Now this duty is relegated to the milling engineer, who is generally in the employ of the mill-building firm. Nor is the reason for this transfer of duty hard to find, for to be able to successfully make the diagram for a mill and insure its starting from the word go, requires an experience and knowledge of milling facts and conditions not to be gained by working in any one or a dozen mills. As milling machinery has grown more complicated and milling methods more intricate, so has the field of mill building widened, and the same man is called upon in the same day to design mills and diagram milling systems for widely separated localities. He is the more fitted for his work because of his enlarged opportunities for gaining new facts and adding to his stock of milling knowledge. And yet it is not uncommon for a mill owner, when about to build or remodel his mill, to place more faith in the opinions of his miller, based upon the experience gained in a

single mill, than in statements of fact made by the engineer who has built a hundred successful mills. Not only this, but the mill builder is sometimes asked to submit to the injustice of being held responsible for the operation of the mill, and to guarantee its results, while his advice as to equipment and operation is flatly disregarded. It occasionally happens that when his advice is followed, the miller will, when the mill is being built, and after it is started, criticize it unmercifully, simply because his ideas have not been followed. I am aware that millers have much to complain of in their treatment at the hands of mill builders, and I have good reason to know that mill builders have equal reason for complaint on account of their treatment at the hands of some millers. In fact, there appears to be a feeling of distrust and lack of confidence on both sides; but I am of opinion that millers in general would have every little to complain of if, they would confine their dealings to strictly responsible builders, whose past reputation for doing good work is the best possible guarantee that they will give value received for the money paid them.

In considering the progress in the art of mill building, and the improvements in the machinery and mechanical appliances at the miller's command, it is not uninteresting to compare the mills recently constructed with those of an earlier date. In no State in the Union, I venture to say, do better opportunities for such a comparison exist than in your own. While I do not know that Pennsylvania can boast of any mammoth roller mills within her borders, there are a good many mills of medium and small capacity which are well equipped on the most approved modern systems. Enjoying the distinction of containing more mills than any other State, there are many of the number still almost as simple as the one over which Crusoe spent so many weary hours. I cannot speak from personal observation, but I am reliably informed that in some of the mills now running, one can find the same old wooden shafting and primitive machinery which has been doing daily duty for several generations. I know for a fact that in one mill in this State, remodeled within the last twelvemonth, the upright shaft was a huge octagonal wooden affair, on which the gearing was held in place by wedges. Slowly, but none the less surely, the slow-moving old wooden and cast-iron shafts have given place to quick running, light wrought-iron shafting; the belt has driven out the upright shaft, and done away with cumbersome gearing; elevators now stand in line, and perpendicular instead of "hit or miss" at all angles; and last, but not least, the millstone has been rolled out of doors, and the roller mill reigns instead. Compared with the mill of fifty or even twenty years ago, the modern-built mill is a marvel of system and convenience, as well as of complex machinery and intricate operation. The majority of your number do not have far to go to make this comparison, and I feel sure that while you may regret the radical changes in time-honored customs, few would willingly go back to old methods; and no one will withhold from the mill builder the meed of praise he has fairly earned by so fully availing himself of every advance in the other mechanical arts to improve and advance his own. When

(CONTINUED ON PAGE 24.)

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G. HURSON, Secretary and Agent.

appointed in their expectations and, perhaps, suffer seriously by putting in such machinery and in such a manner that the entire arrangement cannot be utilized in perfecting the plant some day to a roller mill. It matters little how reputable the firm is who makes you the assurances, that the addition of a few machines to your millstone mill will place you in a position to hold your own against leading mills: such statements are a delusion and a snare. They are wrong in theory, and untrue in practice. They originate from the manufacturer's desire to sell machinery, and not from a conscientious adherence to the truth. Just such a miller, who can only gradually improve, is in the greatest danger of being led astray. There are a host of mill-furnishers and commissioned millwrights who can "fix him up" with one to three machines, to do as good work as the best roller mill. One word of caution in this connection, and emphatically let it be impressed upon your minds, if any of you must add gradually to your mill,—do not consult a mill furnisher or millwright who has not yet realized that the roller system is producing the best flour in the world. None of them are competent to advise you to your best interests, and therefore both are unworthy of your confidence. By all means, consult men who have come to a knowledge of the truth, for they, as a rule, have had experience, and can direct you in the right course, even if you should but want a machine or two. Find men who would sooner miss a sale, or lose a job, than to tell you that a few machines will make your burr mill a perfect mill.

The third miller, who solicits advice in his case, is the harassed and much-advised small miller. He has a small mill, in a small place, with a small custom trade. He feels that his trade will not justify the expenditure of the sum required to secure a full roller plant, and, besides, his mill is not adapted to accommodate an extensive line of machinery. If his trade has not diminished since the advent of gradual reduction, as so many yet loudly proclaim, why so much anxiety about the new system? If his business is so flourishing, why so much solicitude to know how to remodel his mill? The fact is, that the mills are few and far between which have not felt the effects of roller flour's competition. At first the small miller was left unmolested. The introduction of roller milling was like hurling a ponderous object into calm water. The effects were most marked in the immediate neighborhood where the water was first disturbed, but gradually the undulations vibrated farther and farther, until the entire surface was agitated, and the waves leaped from shore to shore. The roller excitement is only reaching the outskirts now. The small miller's customers have had a taste of better flour, and now, like everybody else, they want it, too. If he cannot furnish it, they will go to some other mill and get it, or sell their wheat, and buy imported roller flour. Much of the advice given in the previous case, will apply in this instance. The small miller will experience no trouble in securing roller machinery adapted to his wants. If he thinks it will not pay him to make a radical change at once, let him do it gradually. He will learn, as he progresses, and will appropriate the new ideas more gracefully, and with less liability to commit

serious blunders, than if he is at once confronted with an entire change of programme. He will thus be able to accommodate himself to his changes. However, the small miller will not always find it most advantageous to improve his mill by degrees. Where roller flour has obtained a strong foothold, the sooner he can furnish what is most in demand, the better, if he has the necessary means to do so. There are scores of cases where delay is not only dangerous, but accompanied with serious loss. As stated before, each one should be governed by his personal knowledge, and the question should no longer be, whether an approach to the roller system is progressive and advisable, but how far your means and facilities will permit additions and changes to this end.

And the historic millstone, alas! is it doomed? Not just yet. In devising, "what you are going to do about it," many of you will find that you are not at present prepared to discard the millstone. You are right if you retain your burrs, not as a matter of choice, but out of compulsion. Build no more millstone mills, of course, but make the best of your millstone mills, as long as you must be contented with them. You can ascertain yourself, by careful examination, and also from reliable progressive mill builders, that you can use with your burrs many additions which will prove just as useful when you once remodel to a complete roller mill. Begin with your cleaning machinery, and make such improvements, as have been indicated, in keeping with your ability.

Whatever of machinery you see fit to purchase, be it a whole outfit, or just a few machines, buy what you need, and buy it of the best. After you have steered clear of all shoals, do no not founder upon the rock of so-called cheapness. How many buy what they do not need, and what they really do not want, simply because it is low in price, and highly recommended by the vendor. To be compelled to secure two or three lines of machinery, before you are satisfied, is entirely uncalled for, and the consequence of nothing else than indiscretion. The miller's experience, on whom has been imposed an unusually low-priced outfit,—what has it been in the past? Either the results were disappointing, the capacity too limited, or there was a general break-down at a time when the mill should have done double work. Toys may be funny things for children, but for millers they lose all their ludicrousness, when in the shape of milling machinery that gives way in the busiest season, the time when the miller is not in a humor to trifle. Take performance in place of assurance, and buy machinery such as you know is giving satisfaction. A good business policy has ever found practical expression, in rather paying a good price for what you know is reliable and genuine, than less for that of which, at best, you entertain certain grave doubts.

Based upon the practical points which have been treated, allow us to apply a few practical hints. Whether you build a full roller mill, or remodel your mill, or only add a machine or more, always bear in mind that you must run the mill yourself, and that it depends upon your individual efforts how much of success you achieve. The greatest error into which millers stray, at the present time, is the delusion that all they need is a

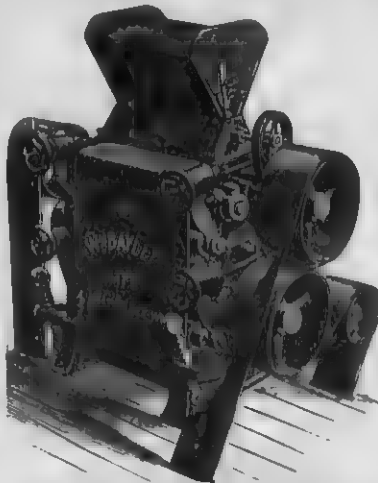
roller mill, or some improvements incident to roller mills, and they are bound to make money. This mistake can be held accountable for much of the reproach that has been heaped upon the roller system. Because some have failed from a lack of the necessary qualifications in operating the mill, the system is charged with the wrong, and condemned. A reliable and competent mill builder can build you a genuine roller mill, but he cannot operate it for you, neither can he guarantee that each one who wants a roller mill is capable of handling it. Those of you who have made a practical test of the matter, well know that there is more necessary to success, than the mere desire to run a roller mill profitably. The average burr miller must release many of his former ideas and practices, and must, in turn, adopt and appropriate approved methods, in order for him to become skilled in the new art. He must lay aside all prejudice. He must be willing to investigate, and not close his eyes for fear that he will meet with facts which may prove his ideas erroneous. He must read and reflect. He must seek successful practice and examine it. Every miller should do this, whether he is able to adopt the acknowledged improvements, or not. How many millers, did they follow such a course of education, would save themselves much annoyance, great loss of time and money, when the time comes to remodel their mills. They would be prepared to meet the obstacles. They would know how to begin, and how to proceed, without costly experiments and expensive mistakes. They would not expect the mill to run itself and make money. These are the men who are ready for the tide when it comes. Even though they are pecuniarily unable to make many changes in their mills, or their facilities will not warrant a heavy expenditure, they are not indifferent to the movements of progress. Every milling method is closely scrutinized; every source of information, as to milling, is consulted; every opportunity is improved, to acquire familiarity with the principles of the art and science to which they are devoted. The wide-awake miller thus keeps abreast with the times in his ideas and skill, as far as extensive observation and devoted study make this possible; and just as soon as the means are at hand to put into practical effect the results of his experience, he is ready to take advantage of a timely season, without hesitation and without doubt. It will not be necessary for his competitors to first lead away his entire trade with modern flour, before he sees that it will be absolutely indispensable for him to cater to the tastes of his patrons, in order to do some business.

While you are casting about, solely perplexed, as to "what you are going to do about it," help one another. When you assist each other, you not only obey the promptings of true manhood, and feel the satisfaction consequent upon every such act, but you follow a business policy that from time immemorial has won the favor of the multitude, and has brought its substantial reward. We would point out as one of the greatest drawbacks to general advancement within the limits of this State, our conservatism, and disposition to conceal our mode of milling, lest some neighboring miller, per chance, may learn something. This practice is detrimental to the best interests of the milling industry of the

Keystone State, and would be anywhere. It is a narrow view which arrogates all the knowledge and authority on a subject. We learn by experience, observation and interchange of ideas. Who has not heard the German adage? "Two heads are better than one, if both are sheepheads." Another's views are worth knowing. If left to ourselves we may imagine we are perfect, and how can we tell we are not? Only by dearly bought experience, if we do not invite criticism. Anybody can flatter. Our worst enemy can practice the art with a malignant purpose underlying it. But the friend it is, who will tell you kindly of your faults. We subserve our own interests, by contributing to the elevation of the industry within the bounds of the association. When we aid each other in the march of progress, by united effort, mutual advice and zealous co-operation, and thus raise the standard of Pennsylvania flour in the estimation of the public, a common good is attained. We only give foreign competition an advantage, by delaying each other's movements towards better mills. Is it necessary for the West to be five, ten, fifteen years ahead of us continually, and thus come in and furnish the bulk of the flour that is consumed in this State? The conditions of success for the industry are present. Pennsylvania produces the best winter wheat known in the world. Ohio millers cross the borders of their State, and hie away with our longberry wheat, whenever and wherever they can. A market exists for the offal in this State, and if the home supply of wheat is not sufficient, we are at no disadvantage in shipping in wheat, when we have a good demand for the flour and the feed. Some points will suffer, more or less, it is true, from unjust railroad discriminations; and in passing this by, let us look for such legislation as will forever put an end to such unjust practices. The miller must stand upon his own footing. Fight the competition with its weapons. Do not rely upon abusing Western progress. Put no trust in combinations to keep out superior goods. History has shown all such mode of warfare futile. Elevate the grade of your flour. Let the public realize that Pennsylvania makes the best flour in the land, and then when you ship your goods to Eastern markets, it will no longer be necessary to omit "Pennsylvania" on the brand of your barrels, and substitute "Ohio" in its stead. The flour will sell upon its own reputation and upon its own merits, and the great old Keystone State will be held up to the world, not as following, but as leading in the van of milling progress. Gentlemen, you now have our personal views upon "Practical Points," gathered from observation and experience. Having no axe to grind, you may accept them as, at least, the expressions of candor. Allow us to indulge the hope that, though many of you take issue with us now, you may, in the early future, realize that your best interests were subserved in our feeble efforts. Our cordial good wishes find utterance, when we say, success to the Pennsylvania Millers' State Association, and to everyone within the guardianship of its tutelage. May each recognize the flour his trade demands; may he find the system of milling which will manufacture it the most economically; and, above all, may he "do about it" that which will secure the goal of his ambition and his efforts.

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UNITED STATES MILLER.

PUBLISHED MONTHLY.

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MILWAUKEE, NOVEMBER, 1885.

ANNOUNCEMENT:

WM. DUNHAM, Editor of "The Miller," 69 Mark Lane, and HENRY F. GILLIS & Co., 449 Strand, London, England, are authorized to receive subscriptions for the UNITED STATES MILLER.

We send out monthly a large number of sample copies of the UNITED STATES MILLER to millers who are not subscribers. We wish them to consider the receipt of a sample copy as a cordial invitation to them to become regular subscribers. Send us One Dollar in money or stamps, and we will send THE UNITED STATES MILLER to you for one year. SEE COMBINATION OFFER ON OTHER PAGES.

The United States Consuls in various parts of the world who receive this paper, will please oblige the publishers and manufacturers advertising therein, by placing it in their offices, where it can be seen by those parties seeking such information as it may contain. We shall be highly gratified to receive communications for publication from Consuls or Consular Agents everywhere, and we believe that such letters will be read with interest, and will be highly appreciated.

TO ADVERTISERS.

Milwaukee, Wis., Oct. 1, 1885.

To Those Interested in the Flouring Trade:

THE UNITED STATES MILLER is now in its tenth year, and is a thoroughly established and much valued trade paper. It has a large regular list of domestic and foreign subscribers. It is sent monthly to United States Consuls in foreign countries, to be filed in their offices for inspection by visitors. It is on file with the Secretaries of American and European Boards of Trade for inspection of members. Aside from the above, thousands of SAMPLE COPIES are sent out every month to flour mill owners who are not subscribers, for the purpose of inducing them to become regular subscribers, and for the benefit of those advertising in our columns. Every copy is mailed in a separate wrapper. Our editions have not been at any time since January, 1882, less than 5,100 COPIES each, and are frequently in excess of that. We honestly believe that the advertising columns of the UNITED STATES MILLER will bring you greater returns in proportion to the amount of money invested than any other milling paper published. Advertisers that have tried our paper for even a few months have invariably expressed themselves well satisfied with the results. Our advertising rates are reasonable. Send for estimates, stating space needed. The subscription price of the paper with premium is One Dollar per year. Sample copy sent free when requested. We respectfully invite you to favor us with your patronage. We shall be pleased to receive copies of your catalogues, and also trades items for publication free of charge. Trusting that we may soon be favored with your orders, we are,

Yours truly,

UNITED STATES MILLER.

E. HARRISON CAWKER, Publisher.

C. H. SEYBT, Esq., of Highland, Ill., has been spending a few days hunting in the Northwest. On his return he made a short visit to his many friends in Milwaukee. He was highly pleased to hear the news in regard to the rebate on jute sacks.

WE are in receipt of the prospectus of that popular young folk magazine WIDE AWAKE, published by Messrs. D. Lothrop & Co., Bos-

ton, Mass. The handsome illustrations and refined and entertaining reading matter in this magazine in the past have been all that could be desired, but the publishers will in the future enlarge the size and add greatly to the attractions heretofore familiar to their readers. All young people will be charmed with it. The subscription price is only \$3.00 per year. We will furnish WIDE AWAKE and the UNITED STATES MILLER for one year to any address for \$3.50.

ALL persons connected in any way with the milling industry will find it a blessing to have a copy the UNITED STATES MILLER sent regularly to their address. We will send a sample copy of it free to all in the trade who may apply to us for a copy. You can examine it carefully, read our premium and book lists, and we believe that you will, after a fair inspection, feel that it is to your interest to subscribe. It only costs, with premium, one dollar per year. The UNITED STATES MILLER has been published nearly ten years, and the experience and knowledge gained by its publisher in that time is a sufficient guaranty of a valuable paper.

THE wheat weevil is proving to be a great drawback to the Indian and Australian wheat trade. Much of the grain received in Europe from these countries is seriously damaged. One importer recently visiting this country, told us that in one instance the loss to him amounted to 20 per cent. on account of damage by weevil. This insect multiplies with great rapidity, it being estimated that one pair will produce in one summer no less than 3,045 individuals. If grain is kept in a temperature of 50 deg. Fahr., the weevil will not propagate, consequently cold storage is advised as a prevention of their ravages.

MESSRS. WM. KLEIN & Co., London, in their circular, bearing date Oct. 17, say:

The flour trade remains in the same position as reported last week; the demand from consumers continues fairly active, but English millers are taking old prices, and until this state of things is remedied it is hopeless to look for such an improvement in prices as is foreshadowed by the ideas of American millers. A material improvement in prices and demand is, however, on the programme for the coming winter, and the sooner English millers will lay this to heart and follow the lead of their American cousins, the better for them and the trade generally.

MILL OWNERS should not fail to answer the inquiries on another page concerning capacity of mill, power used, etc., at once. It is to your interest to do so. Don't be behind others in making replies. We have taken the pains and expense to fix up a blank in the paper, so that you will have but little trouble to comply with our request. No mill owner who considers himself of any importance should fail to take advantage of this opportunity to be fully and correctly reported in Cawker's Flour Mill Directory for 1886.

MILWAUKEE NOTES.

The Northwestern Mills are not in operation at present.

Mr. Wm. Moore, of the firm of Wm. Moore & Co., flour factors, Liverpool, Eng., has

made our city a visit during the past month. He says he does not see as yet anything to encourage the belief that there will be any great boom in the flour business in Great Britain at any early day.

A railway track will be laid down in front of the flouring mills on Commerce Street (formerly the canal) very soon. When it is laid, all the mills in the city, except the Reliance, Gem and Cream City, will have railway facilities at their doors.

The Cream City Iron Works are building a very large addition to their works on Florida Street. The enlargement has become a great necessity on account of the rapid increase of business enjoyed by this well-known establishment.

MILLS IN SPAIN.—According to the latest official returns, (1884) there are in Spain, 53,449 flour mills, employing 126,187 persons. Of these, 18,565 mills, employing 33,167 persons, are driven by wind power; 33,069, employing 79,321 persons, use water power, 1,797, employing 13,047 persons, use steam power, and 18, driven by gas engines or compressed air, employ 52 persons.

REBATE ON JUTE BAGS.

OUR readers will be pleased at the result of the efforts of the Committee who visited Washington in behalf of the Millers' National Association, to secure a modification of the absurd regulations governing the collection of Drawback on Jute Bags exported with flour.

For about two months these drawbacks could not be collected. Entries were being filed as formerly, but, inasmuch as the regulations could not be complied with, the rebates were withheld. While these restrictive regulations were aimed particularly against flour sacks, and in the interest and for the benefit of one particular party, backed by powerful political influence, it did, in fact, suspend the collection on all articles manufactured from imported materials, such as tin, salt, rope, etc., by requiring an original Bill of Lading of the exported merchandise to accompany the certificate of exportation. Owing to the fact that an original Bill of Lading is a negotiable paper, the issuance of two sets of originals would prejudice the security of all, consequently it became an utter impossibility to comply with the regulation.

Other manufacturers of export goods will also reap the benefit of the work of the Committee. We understand parties, other than millers, have been laboring industriously for several weeks to secure such modification, but failed.

One of our contemporaries (*The Millstone*) has been intimating very broadly that the National Association was as good as dead, but to us who see the work accomplished from month to month for the benefit, not only of its members, but of the entire milling interest of the country, we must consider it a very lively corpse. We congratulate Messrs. Seamans and Pillsbury upon the success of their mission.

The result obtained by their solicitation will be worth not less than \$500,000 to the millers of this country during the ensuing year. This is certainly a good result of having a national association to look after the general interests of the trade.

LATER.—Since writing the above, we have received from the Department a copy of the circular making the changes referred to, which we give here in full. The millers are to be congratulated on the prompt action taken by the Department, and upon having such efficient representatives of their interests as Messrs. Pillsbury and Seamans.

CIRCULAR

Amending Circular No. 77 of June 3, 1885,
Relative to Drawback on Bags.

1885.

Department No. 157.

Division of Customs.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
WASHINGTON, D. C., Oct. 28, 1885.

To Collectors and other Officers of the Customs:

Circular No. 77, of June 3, 1885, is hereby amended by striking out the whole of the second paragraph in Section 9 and substituting therefor the following:

"The inspector superintending the lading of the bags shall report the measurement and the character of the same, and shall, when required by the collector, cut ears from as many of the bags as may be necessary, to be sent to the appraiser for his report as to the quality of the material.

"The bills of lading required by Article 978 of the General Regulations, may be marked, as heretofore, 'not negotiable,' or 'for customs purposes,' but all such bills filed on and after Jan. 1, 1886, must bear, in addition to such mark, the words, 'No other copy for custom-house purposes has been issued.'"

DANIEL MANNING,
Secretary.

WHO MADE THE FIRST OATMEAL IN THE UNITED STATES?

An article going the rounds of the papers asserts that a certain oatmeal mill in Ohio was the first in this country to manufacture oatmeal. This is a mistake. The UNITED STATES MILLER learns from an old Vermonteer that in the State of Vermont, there are several places which were settled by people from Scotland, and that at a very early period they manufactured oatmeal, as the following extract from the *Vermont Historical Magazine* will show: [See p 273., ¶ 4.]

"Barnet was chartered in 1763."

"For many years after the settlement of the town by the Scotch, they manufactured large quantities of oatmeal. Dr. Johnson, who had a powerful prejudice against the Scotch, defined oatmeal as a 'food for men in Scotland and for men in England.' Upon which a Scotch nobleman exclaimed, 'Where will he find such men as Scotland produces, or such horses as England is famed for?' Oatmeal was highly serviceable to the first settlers, and was furnished to the surrounding towns clear to the Canada line, and even beyond it. In one of the years of scarcity of provisions, a man from a distant town came to Barnet, and, having obtained a sufficient supply of oatmeal for his famishing family, expressed his gladness and gratitude by exclaiming, 'Blessed be the Scotch, for they invented oatmeal.'"

In the town of Craftsbury there is a settlement begun by Scotchmen, who, in 1818, organized a Presbyterian Church, and where our informant, about 1848, visited a mill in which oatmeal was made and was told that orders from many parts of the country for it were filled.

THE TARIFF.

Ancient English Reasons Formulated One Hundred and Seventy-two Years Ago for High-Protective Tariffs.

(For the UNITED STATES MILLER.)

MILWAUKEE, Wis., October, 23, 1885.

The following extracts are from an English pamphlet published in London in 1713. Its title is: "General Maxims in Trade, Particularly Applied to the Commerce between Great Britain and France." The pamphlet was issued under the sanction of the British Parliament, and largely distributed by its members.

(The pamphlet is exceedingly rare. Gentlemen well versed in Protective Tariffs, who have grown old in the discussion of the question, have told me that the one from which I have copied, is the only one they have ever seen. It was sent to me anonymously. I have never been able to find out who was the donor of it, as well as several others equally ancient and valuable.)

You will observe one thing, plainly set forth, that in the days of old, one hundred and seventy-two years ago, English mechanics and factory hands were paid double the wages then paid to French, German, Italian, etc., workmen, and that it was not English free trade that put up or kept up higher wages in England than on the continent, but in fact, English wages were always higher than others. You will also notice that, on account of English wages being so much higher than on the continent, it was set forth as one of the most urgent reasons for maintaining the English protective tariff because *they could not compete with the foreign low-priced labor*. I think it would puzzle our ablest American protectionists to formulate more sound reasons for a protective tariff than you will find in the following extracts. This difference I have noted, that, neither in this nor any other of these old English protection pamphlets, is anything said about the protection of labor or a desire to promote the welfare of the laborer, the mechanic or the artisan. The battle was for the manufacturer only.

The extracts are as follows:

That trade which exports manufactures made of the sole product or growth of the country, is undoubtedly good; such is the sending abroad our Yorkshire cloths, Colchester Bays, Exeter Surges, Norwich Stuffs, etc., which being made purely of British wool, as much as these exports amount to, is so much clear gain to the nation.

That trade is eminently bad which supplies the same goods as we manufacture ourselves, especially if we can make enough for our consumption, and I take this to be the case of the silk manufacture, which with great labor and industry is brought to perfection in London, Canterbury and other places.

The importation upon easy terms of such manufactures as are already introduced in a country, must be of bad consequence, and check their progress; as it would undoubtedly be the case of the linen and paper manufactures in Great Britain, (which are of late very much improved) if those commodities were suffered to be brought in without paying very high duties.

Wise nations are so fond of encouraging manufactures in their infancy, that they not only burden manufactures of a like kind with high impositions, but often totally condemn and prohibit the consumption of them.

That the importation of such goods as hinder the consumption of our own, or check the progress of any of our manufactures, is a visible disadvantage, and necessarily tends to the ruin of multitudes of people.

The exportation of our woolen goods to France is so well barred against that there is not the least hope of reaping any benefit by this article.

The French did always outdo us in the price of labor; their common people live upon roots, cabbage and other herbage; four of their large provinces subsist entirely upon chestnuts; and the best of them eat bread made of barley, millet, Turkey and black corn, so that wages used to be small in comparison with ours.

At Lyons, which next to Paris is the best city in France, they pay nine sous an ell for the making of lustrings, which is little more than five pence English money; and the price paid here for making lustrings is twelve pence per ell.

In the paper manufacture abundance of people are employed for sorting rags in the mills, who earn in France but two sous a day, which is less than five farthings of our money; and the price paid here is four pence a day.

The French working thus cheap, it is no wonder if they afford their manufactures at lower rates than their neighbors.

* * * We outdo, in our thoughts, all the world in the woolen manufactures; but not depending upon this single advantage of working better than others, we have laid very high duties upon all foreign woolen goods, and even prohibited them. And it is well we did so; for else the French would have made our hearts ache since the peace, by their great importation of woolen goods upon us.

The manufacture of paper is very near akin to that of linen. Since the high duties laid on foreign paper, and that none hath been imported from France, where it is cheapest, the making of it is increased to such a degree in England that we import none of the lower sorts from abroad, and make them all ourselves. But if the French duties be taken off, undoubtedly most of the mills which are employed in the making of white paper must leave off work, and £80,000 to £40,000 a year remitted over to France for that commodity.

The next article concerns the silk manufacture:

Since the late French wars it is increased to a mighty degree. Spittlefields alone manufactures to the value of two millions a year, and were daily improving, till the late fears about lowering the French duties, *What pity*, that so noble a manufacture, so extensive and so beneficial to an infinite number of people, should run the hazard of being ruined! It is, however, to be feared, that if the French can import their wrought silks upon easy terms, they outdo us so much in cheapness of labor, as hath been already showed * * * that in all probability half the towns in Spittlefields would be laid down, and our ladies be again clothed in French silks; the loss that would accrue to the nation by so great a mischief cannot be valued at less than £50,000 a year.

I have never yet found any one well read in tariff history, but admits that England's great prosperity and vast wealth, which she so long possessed, making her the leading nation of the world, was first inaugurated and so long sustained through the hundreds of years of her highest most prohibitive tariff system ever known. Nor was this exalted position ever successfully disputed, until other nations adopted tariffs "for the encouragement of and protection of their own manufactures." I will give but one more extract:

"All the nations of Europe seem to strive who shall outwit one another in point of trade, and they concur in this maxim, that the less they consume of foreign commodities, the better it is for them."

The maxim concluding the last selection is as true to-day, and as worthy of careful consideration, as when uttered in the high protective tariff days in England, one hundred and seventy-two years ago.

JOHN W. HINTON.

NUTRITIVE VALUE OF THE DIFFERENT PARTS OF THE GRAIN OF WHEAT.

M. Aime Girard has recently contributed an interesting article on this subject to the *Annales de Chimie et de Physique*. He treats the grain of wheat as consisting essentially of three parts: (1) The integument, including not only the pericarp, but also the outer envelopes of the endosperm or albumen; (2) the embryo, separated from the endosperm; and (3) the mealy endosperm, freed from its outer envelopes. He discusses these three constituents in detail, from the points of view of their anatomical and chemical composition, the part taken by each in the composition of bread, and their properties in relation to digestion; the general result being that the endosperm is the only part of the grain which is of value for nutritive purposes without a compensating drawback, the integuments and embryo being either useless or actually injurious.

The integument, which makes up 14.36 per cent. of the entire grain, is rich in nitrogenous substances, to the extent of 18.75 per cent., but these substances are only to a very small extent soluble in the digestive apparatus of man; the portion that is thus assimilable being only 0.4 per cent. of the whole grain. Among these nitrogenous substances is the cereal in discovered by Mege-Mouries, the ferment which causes the formation of black bread. In addition there are mineral substances which are soluble in the gastric juice to the extent of 0.45 per cent. of the grain.

The embryo contains a still larger proportion of nitrogenous substances than the integument, and especially of such as are apparently assimilable. But it also is of scarcely any service for nutrition, because of the large proportion which it contains of the injurious cereal in, in addition to a very easily oxidizable oil, which easily escapes from the cells in which it is formed, distributes itself through the flour, and assists in its decomposition. The maximum amount in the embryo and integument together serviceable for nutrition is 1.0 per cent. of nitrogenous and 0.5 per cent. of mineral substances. And even of those nitrogenous substances which are soluble in water, the greater part appears to be of very small nutritive value.

This small addition to the nutritive value of the grain of wheat is greatly outweighed by the disadvantage of the increased facility for the quick decomposition of the flour given by the presence of these substances, and the increased tendency to the production of an oily, heavy bread. It would appear, however, that substances which are not adapted for digestion by the human stomach can be assimilated by the digestive apparatus of other animals.

The object, therefore, to which millers should especially direct their attention is the discovery of mechanical means by which the integument and the embryo may be removed from the grain, reserving the mealy endosperm alone for the production of flour.—*Pharm. Jour. and Transactions*.

NINE MONTHS' FAILURES.

The total number of mercantile failures in the United States reported to *Bradstreet's* is 8,423 as compared with 8,302 in a like portion of 1884, with 7,358 in 1883 and against 5,307 in nine months of 1882, a gain as compared with

last year of but 121 failures, of 1,065 as against 1884, and of 3,116 when compared with 1882. The gain of nine months' failures in 1884 over those in 1883 was 944, which marks a significant check in the late rate of increase in recorded mercantile deaths. Since July there has been a noticeable decrease in the average total of the list of failures published weekly. If this decline continues during the remainder of the year the probability exists that the total failures for 1885—which early in the year promised to materially exceed the 11,600 reported in 1884—will barely, if at all, exceed those of the preceding twelve months. The total liabilities of the 8,423 failing traders in the past nine months amount to \$90,976,000 against \$195,951,000 liabilities for nine months of 1884; \$123,054,000 liabilities in 1883 and \$71,162,000 of liabilities in three quarters of 1882. This record points to a close approximation to what may be called the normal, when the growth of population is considered, within three years. The past nine months' actual assets of the 8,423 failing traders amounted to \$43,864,000 as compared with \$108,452,000 assets in 1884, with \$63,262,000 assets in 1883, and with \$36,452,000 assets in nine months of 1882. The percentage of total nine months' assets to total liabilities in 1882 was 51; in 1883 it was 52, and last year it was 55 per cent. During the nine months ended September 30 the percentage of actual assets to liabilities was but 48.2 per cent. The details for nine months by groups of states, for New York city and for Canada and the Provinces, as well as for the third quarter of 1884, are as follows:

NINE MONTHS' FAILURES, 1885.			
United States Divisions.	No. of Failures.	Actual Assets.	Liabilities.
Eastern.....	1,106	\$4,468,916	\$11,649,254
Middle.....	1,806	13,740,556	27,629,417
Southern.....	1,013	8,772,644	18,871,490
Pacific.....	746	3,037,999	5,901,010
Western.....	3,914	12,839,712	25,249,514
Territories.....	236	1,015,873	1,075,073
Total United States.....	8,423	\$43,864,000	\$90,976,358
Canada and Provinces.....	984	3,391,167	7,190,967
New York city.....	254	5,181,996	9,112,288

THIRD QUARTERS' FAILURES, 1885.			
United States Divisions.	No. of Failures.	Actual Assets.	Liabilities.
Eastern.....	821	\$1,487,604	\$3,548,749
Middle.....	699	3,327,454	6,918,108
Southern.....	329	1,387,410	2,491,380
Pacific.....	258	972,542	2,080,517
Western.....	798	3,961,230	6,804,487
Territories.....	73	342,965	589,687
Total United States.....	2,317	\$10,909,395	\$22,405,853
Canada and Provinces.....	246	802,735	1,697,801
New York city.....	79	881,347	1,761,821

The 2,317 failures in the United States in the last three months are to be compared with 2,858 in the third quarter of 1884. The third quarter's liabilities (1885) are but \$22,405,000 against \$71,846,000 last year, and the assets but \$10,909,000 against \$37,722,000 in the third quarter of 1884.—*Bradstreet's*.

DUTCH RICE.

The finest rice, says the *New York Sun*, is known as Dutch rice and comes from Amsterdam. It is grown in Java and milled and polished in Amsterdam by some peculiar process which American millers are very anxious to learn. The "Dutch rice" has more perfect grains, a better luster, and is less broken than rice milled in this country. Many attempts have been made to learn the Dutch process, but they guard it with jealous

care and allow no one in their mills. It is suspected that they use oil, as the rice when confined in a bag for some time gives the cloth a soft, greasy feeling.

Recently the state department sent out a circular to consular officers requesting information concerning the preparation of rice. The consuls had no better luck than other people. They recently reported that the manufacturers declined to divulge the secret, saying that it was of the utmost value for them to preserve it, and that they would not furnish the method to their own government. The Dutch rice is worth one-quarter of a cent more per pound than other rice, simply because of its fine appearance, but when cooked it is no better than other rice.

American millers are secretive about their own process of milling and decline to allow strangers to go through their works. There is only one mill in this city, that of Crampton Brothers, at Monroe and Jefferson streets.

The grain comes from the threshing mill as rough rice or paddy, and requires grinding to free it from the hulls. It is first screened to get rid of the sand, and is then passed between a pair of heavy stones, five feet across, to remove the outer husk. Thence it goes into large wooden mortars, the iron-shod pestles to which weigh 250 to 350 pounds each, and is pounded for two hours, when it is ready for screening. Some mills clean the rice by means of wire cards, without pounding. Finally the rice is screened into flour, broken rice middling rice and prime rice. The prime rice passes into the polishing or brushing screen, which is a vertical cylinder, laid up and down with shreds of sheepskin and made to revolve within a wire screen. This cleans off the flour and gives a polish to the grains.

The best rice produced in this country is grown in South Carolina. The Chinese consume a great deal of rice in this city, and are said to use only the best quality. The majority of New York families serve boiled rice as a sort of a paste, with the grains all merged together. In the South, where its cooking is properly understood, it is served with every grain clean and distinct. It is eaten there as vegetable, with pepper and salt, while North it is regarded as a dessert and eaten with sugar or molasses. It is said that the rice should be put into salted water which is boiling hot. In five minutes the water should be drained off, and the covered pot left for 20 minutes longer on the coals.

THE FLOUR KING.—The *Saratoga* correspondent of the *Chicago News* says: These piazzas, however, are crowded with successful men who have not felt the compensatory burthen of a great sorrow. One among them, hearty and grangerlike, is the man C. A. Pillsbury, the flour king, as he delights in being called. Only 42 years old, sixteen years a Minneapolis miller, he is the possessor of a good many millions, and he is as proud of them as a young lady is of an engagement ring. During the time he has been a miller the business has, by reason of mechanical improvement, known a complete revolution. One of his mills produces 6,186 barrels of flour in a day, the others two 2,000 and 1,500 respectively, making in round figures, say, 10,000 barrels of the great food material of the civilized world.

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1.50 American Agriculturalist.....	2.00	4.00 Frank Leslie's Chimney Corner.....	4.25	3.00 St. Nicholas.....	3.60
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(OVER.)

—OFFICE OF—
CAWKER'S AMERICAN FLOUR MILL AND MILL FURNISHERS' DIRECTORY
 —AND OF—
THE UNITED STATES MILLER,
 124 GRAND AVENUE,
MILWAUKEE, WISCONSIN.

GENTLEMEN:—It is the duty of business men to use all honorable means in their power to secure business. We therefore suppose that all millers, whether proprietors of large or small mills, will be glad to adopt such means as will be likely to bring increase to their business. We desire to state that in January, 1886, we shall go to press with **CAWKER'S AMERICAN FLOUR MILL AND MILL FURNISHERS' DIRECTORY**. It is desirable that this work shall contain the name of every person or firm in the United States and Canada owning a flour mill, together with correct post office address, capacity of mill in barrels of flour *per day of twenty-four hours*, and the kind of power used to run the mill, whether steam or water, whether stones or rolls or both are used, etc. Is it not worth your while to sit down and write us, giving these particulars? We think it is, and will tell you why. This Directory is purchased and used by wholesale flour dealers in the large cities in this country: east, west and south; by flour exporters; by European flour importers; by railway, lake and ocean transportation companies, insurance companies, by mill furnishers and all manner of dealers in machinery and supplies used in and about flouring mills; in short, by every class of business men in all parts of the United States, Canada and Europe, desiring to transact business with American millers. Is it not worth your while to be properly represented in a book looked upon as *authority* by these classes of people that have business to transact with you? We assure you that you will find yourself more than repaid for the small amount of time and expense incurred in sending us these particulars by the information you will receive through the many circulars, journals, market reports, etc., sent you by the users of this Directory, giving you *free* an insight of the general business being done in your line of trade throughout the world.

Previous to the year 1876, no such work was published, but the undersigned, who was then as now, engaged in the publication of the *United States Miller*, having received so many letters from parties all over the country asking for addresses and information of a general character about millers, conceived the idea that there was a demand for a work of this class, and consequently, in the year 1876, prepared the first Milling Directory ever published. This was followed by corrected and enlarged issues in the years 1878, 1880, 1882 and 1884. The last (1884) was the most complete and perfect book we could possibly get up at the time and has given great satisfaction, but it was not as complete in detail as we could wish, for out of 26,000 millers to whom we sent circulars but about 11,000 replied. *They were either too lazy, negligent or thoughtless to look after their own interests.* Now that we have explained the matter in full to you, we trust you will answer our questions promptly. We further desire to ask in all modesty, that considering the fact that we have fathered this enterprise and assumed a considerable pecuniary responsibility that you will subscribe for our paper (*The United States Miller*, price \$1.00 per year). The paper is well worth the price and we believe we deserve the encouragement your subscription will give us.

Should you wish your name or name of your firm inserted in **full-faced type**, in the Flour Mill Directory, we will send you the U. S. Miller for one year and your name so displayed for \$2.00. The following will illustrate: Supposing John Brown & Co., of Minneapolis, Minn., write us that they have a mill driven by steam and water power, using both stones and rolls and having a capacity of 500 barrels of flour in twenty-four hours, this is the way it would appear in the Directory, *not displayed*:

○●*†500 John Brown & Co., Minneapolis, Minn.,
 or displayed:

○●*†500 **John Brown & Co., Minneapolis, Minn.**

The first sign used means, stones—the next, rolls—the star, water-power—the dagger, steam-power; the figures, number of barrels of flour the mill can make in twenty-four hours. By having your name displayed as above, it will attract especial attention, which will certainly prove of benefit to you.

Now, gentlemen, in conclusion, we beg you to answer our questions at once. Subscribe if you please—display your name if you please and *help a valuable business accessory along*, but at all events send us the information asked for. Address

E. HARRISON CAWKER,

Publisher UNITED STATES MILLER, Milwaukee, Wis.

What is the name of proprietor, or firm?

Name Post Office.....

County State

Do you use water or steam power?

How many barrels of wheat flour can your mill make in 24 hours if you run up to full capacity?.....

Do you use the Roller or Stone system, or both?

Do you make an important specialty of making rye flour, corn-meal, oat-meal, buckwheat. or hominy?.....

Please enclose your business card and oblige us with the names of all mill owners who receive their mail at your post-office, and give us any information that will tend to make our work perfect.

If by chance this should be addressed to anyone not in the flour milling business, oblige us and the trade by dropping us a postal card saying that you are not in the business. [OVER.]

ROLLER CORN MEAL MILLING.

BY J. M. CASE.

Editor of the United States Miller, Milwaukee, Wis:

Dear Sir:—I send you herewith a brief statement embodying the results of my experience in corn meal milling. The matter of manufacturing corn meal upon rolls is beginning to agitate the millers to a great extent. Our inquiries in this direction are multiplying daily. Our success in mills already built has led the writer to believe that it is only a question of time when corn meal will be made exclusively upon rolls, except in small country mills, which depend upon local custom trade. All meals for the general trade or market, manufactured by the larger milling firms, will be made upon the roller system. The expense of such a system proportionate to the power required and the output is not much, if any, greater than it is when made upon the millstones. The power required to reduce corn meal on rolls is considerably less than that required to reduce the same quantity on burrs.

In my first experience in the reduction of corn on rolls, one of the first things I discovered was that the system of handling the breaks in the manner usually handled on wheat, is entirely erroneous. If the tail of the first scalper is sent to the second break machine, and the tail of the second scalper to the third break roll, and so on through as it is done in wheat milling, the results will be scarcely any better than the ordinary stone ground meal. The reason of this is that the bran and chit becomes so thoroughly pulverized and intermingled with the meal as to greatly impair its quality. Upon the discovery of this fact the writer took the precaution to apply for patents, which will soon be issued, upon a system of reducing corn to meal, which is substantially as follows:

Upon the first break, I break the corn down sufficiently to remove almost the entire outer coating of the bran. It is found in practice that this bran peels off in large flakes almost the size of a grain of corn, and that the chit, and black speck upon the end of the berry, will usually cling to the bran and pass off with it. If the proper corrugations are used and the rolls are properly set there is scarcely any gluten or starchy material that will be found in the bran coating. Instead of sending this bran and chit to the second break, I send it direct to a tailings or bran roll at the tail of the mill. The head of this scalping reel is clothed ordinarily with about No. 18 wire, and the tail of the same with No. 6 wire. The material which passes through No. 18, is sent to a meal separating reel, and that which passes through the No. 6 wire is sent first to an aspirator, and from thence to the second break roll.

The second break is sent to a scalping reel, clothed ordinarily with about No. 22 wire at the head, and No. 10 at the tail. That which passes through the head of the reel is sent to a meal separating reel, and that which passes through the No. 10, to a second aspirator, and the tail of this second reel goes direct to a bran or finishing roll. This same process is carried out in the third break also, which number of breaks I find sufficient to reduce the corn sufficiently to send to the meal separating reels. The tail of the meal separating reel is also sent to an aspirator, which blows

out the fine fibrous and branny material, and this purified gritz is sent to a roll for reducing it to meal, and returns to a second meal separating reel. The tail of this second meal separating reel is sent to a low grade roll, together with all of the material which has been blown out by the aspirators. This low grade stock, together with the bran stock, is bolted in a separate reel, and drawn off as low grade meal. A sufficient amount of first grade meal may be intermingled with the bran, or low grade meal, to bring its grade up to any standard the market may demand, or a standard equal to the stone ground meal, which would be ordinarily about 20 per cent. of the entire product, leaving the first meal of a very high grade, which in the market would bring a much higher price than stone ground meal. With this system of handling the stock there is never a loss of over three pounds to the bushel, and seldom over two and one-half, or in other words, 56 pounds of corn will make 53 to 53½ pounds of meal.

The meal made upon this system differs from that made upon the burr system in the following particulars: In the first place it is much freer from black specks, germ product, and light flakes of branny matter.

In the second place it is much more granular, and in baking it operates just the same as granular flour. It will raise higher and produce a much lighter loaf. This is due to the fact that the granulation is round and sharp, and not flattened as in the burr ground meal. The result is that when the meal is wet up and baked, these round granular particles burst open and expand, causing the lightness of the loaf. There is another feature of this class of meal, which is very distinctly observed, and that is it is sweeter to the taste than stone ground meal. The meal will also keep better and is much less liable to sour, owing to the fact, that its being so granular, it gives the air an opportunity to circulate through it and prevent heating. Another fact connected with it is, that in the various manipulations which it goes through in the production of meal, it gets a thorough aeration, and thus much of the moisture becomes evaporated. If it is desired to make a very high grade of pearl meal, it is necessary to put in ahead of the rolls a degerminating or hominy machine, but in all ordinary cases this is scarcely justifiable, as it makes a much larger quantity of low grade meal, and the hominy machines require a large amount of power to operate them. The meal made on this system, without the use of hominy mills is almost equal to pearl meal, although not quite up to it. The corrugations used for this purpose, which I have found best in practical operation, is one-eighth back cut saw tooth for the first break, one-sixteenth front cut saw tooth for second break, one twenty-fourth front cut saw tooth for third break, one twenty-fourth front cut saw tooth for the bran and aspirator stock, and one thirty-second front cut saw tooth for grinding the unfinished gritz.

For a 300 to 350 barrel corn meal mill it will require six double sets of 9x80 rolls, four scalping reels 12 feet long, two meal separating reels 12 feet long, four aspirators and one corn cleaner. This constitutes the entire machinery for a mill of the capacity above referred to. It is possible to make a very excellent result from the use of but one double set of rolls, and one meal separating and aspirat-

ing machine. But in view of the fact that I am making this article quite lengthy, I will not undertake to describe this short system, but will do so, if you desire, in the next issue of your paper, and will furnish diagram and system of separation such as we have found to be most successful in our system of corn meal milling. This matter, the writer believes, will be of considerable interest to parties having limited power, and desiring to utilize it for the purpose of manufacturing roller corn meal. The power required to operate such a mill on this short system would not exceed 10 to 12 horse-power to produce from 35 to 40 barrels in 24 hours.

MILLING PATENTS.

The following list of patents relating to milling interests granted by the U. S. Patent office during the past month, is specially reported by Stout & Underwood, Solicitors of Patents, 66 Wisconsin Street, Milwaukee, Wis., who will send a copy of any patent named to any address on receipt of 50 cents:

Issue of Sept. 29.—No. 327,050, grain screen or separator, F. Wulfert, St. Charles, Mo.; No. 327,061, grain screen, S. H. Hills, Mt. Morris, N. Y.; No. 327,332, centrifugal reel, G. T. Smith and W. H. Dickey, Jackson, Mich.; No. 327,333, centrifugal reel, G. T. Smith and W. H. Dickey, Jackson, Mich.; No. 327,390, grain scourer, G. B. Gray, Cardington, Ohio; No. 327,444, millstone driver, J. E. Jones, Utica, N. Y.; No. 327,501, wet-grinding mill, T. L. Sturtevant, Framingham, Mass.

Issue of Oct. 6.—No. 327,607, middlings purifier, C. H. Sinderson, Rockford, Illinois; No. 327,825, dust collector, W. Richardson, Milwaukee, Wis.

Issue of Oct. 13.—No. 328,075, machine for grooving grinding cylinders, P. T. Smith, Milwaukee, Wis.; No. 328,105, cleaning, hulling and grinding mill, J. Breitmoser, St. Louis, Mo.; No. 328,260, middlings purifier, J. L. Willford, Minneapolis, Minn.; No. 328,385, grain scourer and separator, G. S. Cranson, Silver Creek, N. Y.; No. 328,413, roller mills W. Krutzsch, Dayton, Ohio.

Issue of Oct. 20.—No. 328,494, apparatus for testing flour, K. W. Kunis, Reudnitz, Germany; No. 328,654, grinding mill, H. Cutler, Wilbraham, Mass.; No. 328,788, grain drier, J. C. Klauder, Philadelphia, Pa.; No. 328,789, flour bolt, B. Kniffler, Cleveland, Ohio.

Issue of Oct. 27.—No. 328,906, cottonseed and grain crusher, J. W. Anthoine, Eufaula, Ala.; No. 329,057, feed regulator for roller mills, etc.; S. Leethan, York, England; No. 329,097, centrifugal bolting machine, E. Streitz, Freienwalde, Germany; No. 329,168, middlings purifier and separator, E. W. Howard, Montevideo, Minn.; No. 329,198, grain drier, J. Milne, Aberdeen, Scotland; No. 329,364, mill stock feeder, G. Cottrell, San Francisco, Cal.; No. 329,365, grain scourer, G. S. Cranson, Silver Creek, N. Y.; No. 329,422, grain drier, A. Wolcott, Wolcott, Ind.; No. 329,423, centrifugal bolting reel, L. Wommer and J. Buck, Minneapolis, Minn.

A lively competition between Duluth and Minneapolis wheat buyers at Grand Forks, Dak., ran the price of wheat up to \$1.00 per bushel Oct. 4.

EASTERN MILLERS AT JACKSON, MICH.

ENTERTAINED BY THE GEO. T. SMITH MIDDINGS PURIFIER CO.

From the Jackson, Mich., *Daily Citizen*, of Oct. 2, we clip the following account of an interesting visit of eastern millers to Jackson, Mich.:

Yesterday twenty-five mill owners, millers and mill-men visited Jackson, on invitation of the Geo. T. Smith Middlings Purifier Co., to inspect the new Eldred Mill, which is pronounced the most complete and best equipped mill in the world. The visitors from Rochester and Buffalo arrived on a special car, and they, with other visitors from various points, over fifty in all, were quartered at the Hibbard House. The strangers were made at home and spent the day in inspecting the workings and points of the Eldred Mill, all pronouncing it the most complete establishment of the kind known. The shops of the Purifier Company were looked over, and other places of interest in Jackson visited, and the day was one of pleasure and profit to the visitors and delight to their hosts.

The following gentlemen are among the visitors: Detroit, Col-Rodney Mason; Rochester, John H. Chase, Fred Wilson, W. S. McMillan, John Weggman, Jacob Gering, James Cornell, H. W. Davis, J. A. Hinds, C. E. Angle, Stephen Stone, H. D. Stone, John R. Smith, A. Ferguson, F. C. Armstrong, J. O. Kelly, John McTaggart, David Martin, James Herschell; Medina, N.Y., J. R. Weeld; Charlotte, G. E. Harmon; Buffalo, Fred V. Ogden, George Urban, jr., A. B. Kellogg.

The Purifier Band serenaded the visitors, and they were rendered comfortable and happy. The day was delightfully passed, and in the evening a banquet was given at the Hibbard House. The dining hall was beautifully adorned with plants and flowers, and the tables, which were arranged in the shape of a horse-shoe, displayed a wealth of plate and cutlery glittering in the gas-light, banked with choice flowers, pleasing alike to the eye and senses. The supper was a grand triumph in the art of gastronomy, and was served in courses. The service and all the appointments were in keeping with the splendid repast provided. Col. Clark, of the Hibbard, and the caterer, George M. Grundel, won warm plaudits for the manner in which the requirements of the occasion were more than met.

At each plate was a beautifully hand-painted card, with the name of the guest, the day, and the year with an appropriate quotation. Each guest was presented with a boutonniere on taking his place at the table.

The different courses were discussed, to the soft music of a band stationed in the hall beneath the stair-case, and the cadences of tune were observed by banqueters as well as musicians. When the cloth was removed, W. K. Gibson, Esq., called the assemblage to order and in a most felicitous speech assumed the duties of toast master. Col. Rodney Mason, at the suggestion of Mr. Gibson, announced the first toast, "Our Guests," and in so doing gave a sketch of the milling interests, the labors, application and genius of George T. Smith, with a narrative of the trials and experiences of years, with their fruition in success and the kindly feeling among all those now engaged in the milling business. The remarks of the Colonel, who also gave a history of the patents and the contests thereon, were of much interest.

Mr. W. S. McMillan of Rochester, responded in a pleasant speech. The gentleman gave a history of the milling interests of the Genesee valley and their products, and closed his remarks with a graceful and warm tribute to the excellence of the Eldred Mill, which he characterized model in every way. He endorsed all that had been said of the superiority of this mill and its admirable equipments. He had known Mr. Smith many years, and paid a handsome compliment to the gentleman, whose inventions had generally promoted the milling interests. He alluded with pleasure to Jackson, its industries and people.

The next toast was by Mr. McMillan, who gave "The City of Jackson." Mayor Pringle responded to this with a history of the Central City, its resources, progress, manufactures, railways and situation. The Mayor imparted much information to the visitors, and happily presented the attractions of the Central City.

"The Milling Press" was responded to by Mr. C. M. Palmer, of Minneapolis, in a few remarks of interest.

"American Industries" was the next toast, Response by James O'Donnell.

Mr. William Kinmont, of Detroit, gave the toast, "Our Host, George T. Smith," and the company rose to their feet with cheers. Mr. Smith modestly bowed his acknowledgments of the honor done him. Mr. Gibson in behalf of Mr. Smith, made a graceful response, who was followed by Erastus Peck, Esq., who in answer to calls, indulged in a speech of felicitous words and images. Mr. Peck spoke of the profession he followed and the aid it had given to millers—for a reasonable consideration. He gave his experience at an early day in Rochester, and related how he left that place years ago, and now Rochester had followed him to Jackson, where they were welcome.

The toast, "Rochester Millers," was briefly and pleasingly responded to by Mr. James Cornell, of Rochester.

Col. W. H. Dickey was drafted for a speech but was too busy looking after the comfort of his friends about him, and Mr. George Urban, of Buffalo, made answer, who was followed by George S. Bennett, who gave the genesis of milling up to then. Mr. Gray, of Milwaukee, was loudly called for, and responded briefly, who was followed by a brief mechanical dissertation by Mr. Holt, the sequence being a corruscation of pleasing words from Messrs. Kinmont, Chase, Wells and Gurling. An essay on bolting followed, by Mr. B. H. Emerson, when Mr. H. A. Hayden responded to repeated calls, with remarks of practical value on milling, the veteran miller giving his experience in business, with good suggestions for its future conduct.

The Eldred Mill, its magnificent equipment and admirable arrangements, with superiority in every detail, were thought of, and Mr. Z. C. Eldred was persistently summoned. He replied briefly and pleasantly, Mr. James A. Hinds, of Rochester, following the gentleman with a few remarks.

Alderman John R. Reynolds responded to to calls, and gave a milling operative's views, evincing study of the subjects on which he spoke, and his remarks were of such a practical nature that the millers present found much profit from his observations.

Mr. W. D. Thompson was called for, but failing to respond, the company with strong

insistency pursued their object in extorting a speech, to which Mr. Thompson made a reply eminently satisfactory—concise, embodying his views on the occasion, and explaining why his remarks were not more voluminous, the lateness of the evening preventing the delivery of the oration he had prepared. In closing, he complimented the Hibbard House and its proprietor, Col. Clark.

The Colonel had retreated before the advance of lively feeling, and Mayor Pringle responded in a manner that evidenced the executive of the city appreciated a man who knew how to keep a good hotel, and the caravansary under whose roof the party were assembled was pleasingly eulogized by the Mayor.

As the infant morn was nigh, Col. Mason closed the pleasures with a dissertation on milling, its aims, its present and future, with the possibilities in store or those engaged in that line. His address was full of good points of much interest, and instructive alike to millers and all listeners. The company then adjourned, pleased with the evening and the kindly fellowship and hospitality that met every one on all sides.

The guests from Rochester are among the mill owners and operatives of the Genesee valley, and every mill in that great section of mills has its attache here. The Flour City is most worthily represented, the stirring, successful, enterprising men engaged in milling being from the beautiful city of the Genesee valley. They are warmly greeted by their hosts and others, and while their visit here will prove instructive and of value, they are welcomed to the Central City. Rochester's mills have always been among the most prosperous in the land, and as their conductors are seen the reason is apparent—careful management, with all the improved machinery, winning the mills of that section their great success. These practical gentlemen inspected with great care the Eldred Mill, and were exceedingly gratified at what they saw—the combination and embodiment of excellent devices and admirable inventions for the production of the best of flour. The critical judges were warm in expressions of satisfaction at what they saw in this mill, and with unanimity termed it, as handsomely expressed by Mr. McMillan, the model flouring mill.

Among these practical millers the great merits of the George T. Smith middlings purifiers are recognized and the excellence of the centrifugal reel is cheerfully conceded. We are glad to know these Jackson products have won their way to favor, by their genuine excellence.

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After starting the Fire; Alarm Whistle; Arrangements for Ascertaining the Water-line; Best time to Blow out; Blowing Out Partially; Blowing Out Totally; Care of the Boiler when not in Use; Care of the Fire; Care of the Fire during short Stops in the Work; Causes of Foaming; Cleaning Out; Cleaning the Boiler; Cleaning the Grate-bars and Ash-pan; Decreasing the Draft, etc.; Defective Feeding Apparatus; Do not Stir the Fire; Dry Fuel; False Water-line; Feeding; Fire and Clean Out Rapidly; Firing into Two or more Furnaces; Formation of Scale; Fuel on the Grate; How to prevent Accidents; Loss of Heat; Low Water; Precautions before Starting a Fire; Precautions as to Closing the Dampers, etc.; Precautions when the Water is low; Precautions on Drawing the Fire; Progress of Firing; Proper Firing; Refilling the Boiler; Regulating the Draft; Repairs; Safety Plug; Safety Valves; Smoke from the Chimney; Steam Pressure; Test in the Boiler; The Float; The Gauge Cocks and Glass Gauge; The Steam Gauge; The Water; The Water-line; To Examine the State of the Boiler; Trimming and Cleaning outside.

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you measure the difference between the mill of Oliver Evans' time and the complete roller mill of to-day, you can also measure the difficulties the milling engineer has overcome and the progress he has made. The wonder is greater when we consider that nearly all of this progress has been made within the last twenty, and the greater portion of it within the last ten years. And, although there still remain many differences of opinion, and many vexed questions are still to be answered, there is still such a uniformity of practice as conclusively proves the art to rest on a solid basis of ascertained fact, and henceforward we may look for progress, not in the line of radical changes and revolutions of the present methods, but rather in the perfection of details and the gradual extension of existing methods. The question is sometimes asked, though less frequently now than formerly, "what is going to supersede rolls?" And many millers have let golden opportunities slip by because they were afraid to invest in a roller mill for fear that the whirligig of change would bring something new in place. I can see no danger of such a change taking place in our time, if ever. Whatever change there may be will be in the line of improvements on present systems. Neither do I believe that the millstone will again come prominently into use. Millers and milling engineers are alike too fond of going forward to take any retrograde steps. And while I yield to none in my reverence and affection for the good old-fashioned millstone, whose praises have been sung in some good and much indifferent verse, I am not among the number who believe that all it needs is a first break and brush scalper to restore it to its pristine favor, and enable it to drive the roller mill from its present position. Do not misunderstand me as saying that the millstone will not continue to be used, or that there are not places where a burr mill is not as good as the location will warrant. There probably are such places, even in Pennsylvania, but slowly and surely the circle is widening within which none but mills built on the most approved system can possibly yield a profitable return on the money invested. The influence of the gradual reduction system upon the mills of this country resembles the wave from the pebble cast on the placid surface of a pond. It has spread wider and wider until now the corner is very remote wherein the miller does not feel the necessity of a change to a more modern style of milling.

When I met you four years ago I said that inventors and mill builders would doubtless devise ways and means suited to the requirements of the smaller mills. In this, time has proved me to be correct. I also said that mills of one hundred barrels were as small as the roller system could profitably adopt. In this it seems I was partially mistaken. The past two years have been remarkable in the history of American milling for the great number of mills which have changed over to modern methods, and I believe that over half of the work that has been done in this direction has been done in mills of under one hundred barrels capacity. To-day the greatest demand upon the mill builder is for mills of from fifty to seventy-five barrels capacity. If these mills constituted a class by themselves, and had to meet no competition but from among themselves, the mill builder's task would not be so difficult. As it is, the

smaller mill must be designed to meet the competition of larger mills, and these of still larger. While it is not impossible to do this, if sufficient means are allowed, it becomes very difficult to decide just how far the expenditure can be carried and still be commercially successful, and it is impossible when the appropriation is limited. There is no difficulty in building a good mill of small capacity at a reasonable outlay, but there is a great deal of difficulty in building "the best mill in the country" of small capacity without going to an expense which would leave small chance for any profitable return on the investment. And yet this is what the mill builder is most frequently expected to do. Can you blame him for saying not in haste that all men are liars, but after due deliberation that most millers about to build small mills are very unreasonable. Taken together the best mill builders have done wonders for the small mills during the past three years, and even if the best small mills are not able to compete in quality and yield with Pillsbury and Washburn, they can come so near it as to leave no reasonable ground for complaint. It is true that much of the work in mills of medium and small capacity has been poorly and imperfectly done, but where this is the case it will generally be found that the builder was not so much in fault for furnishing a cheap and poor job as the miller has been in intrusting the work to inexperienced hands, or insisting that it should be done by the lowest bidder. I know I shall be called prejudiced, but I honestly believe that not one miller out of a dozen is a good judge of millwright work, or is competent to tell a good piece of mill building when he sees it. This is one of the discouraging features of mill building, that experience and reputation for good work have so little weight as against gauzy promises and impossible guarantees. Especially is it common among the owners of the smaller mills to exact impossibilities, and to grumble exceedingly when they are not forthcoming according to contract. In this they have been encouraged by a certain class of mill furnishers who, in their anxiety to outdo their competitors, have made up what was lacking in experience and reputation by extravagant promises of what they would do, trusting to luck to hodgepodge the miller when the time for settlement arrived. The owner of a small mill should be particularly careful not to be misled into believing that a plausible guarantee will make amends for lack of machinery or defect in system. While mill building is not and never will be one of the exact sciences, as an art, it rests on certain established facts, and no guarantee, however strong, can make a mill do more or better work than its equipments will allow. I admit that excellence in milling is only relative, and that a short system in certain locations and under certain conditions will produce as good results as may be required, but it does not follow, because the results are satisfactory, that the guarantee has been filled. As the art of milling advances it will become more and more necessary for the owner of the small mill to carefully scrutinize the machinery and systems urged upon him for adoption, and while the mill builder will keep up with the demands upon him, there is a limit fixed by natural laws which he cannot pass. In order to reach a specified result he must be permitted to use suitable and sufficient

means. There can be no great progress further in the building of small mills if cheapness and guarantee are the only things considered. The fact must not be overlooked that the large merchant mills are continually seeking to improve their methods, and are sparing neither pains nor expense to that end. This reacts upon those smaller, and smaller still, until not even the smallest mill is removed from its influence. And if much has been done by the inventor and mill builder for the small mills, as the improvement progresses, it will be necessary for the owners of such mills to make strenuous efforts in order to avoid being left behind in the race.

In talking with one of our prominent mill builders a short time since, he remarked that one great trouble with American mills, especially small mills, was that too much work had been done in too short a time, that changes had been made in two years, which it would have been better had it taken ten years to accomplish. While I do not wholly agree with him, I can see on every hand ample evidence that much of the work has been hastily and not thoroughly done, and for the most of the shortcomings the mill builders have been, and are still held responsible. With the ever increasing closeness of competition, the mill builder has hard work ahead to improve or even keep up to the present standard, unless he is ably seconded by the miller.

The miller who is about to build a new mill or remodel his old one, should bear in mind that the standard of excellence in the art of milling is being raised, and that, to avoid the necessity of frequent changes in his mill, in order to keep up with the milling progress, he should study the present state of the art carefully, and aim to build in advance of it if possible. It is not enough that when finished the mill shall barely be able to meet the requirements of to-day. It should do more than this if possible, or the necessity for change and its accompanying expense will surely come. It is poor policy to save a few hundred dollars at the first by cutting down the bill of machinery, shortening the system and doing a cheap job generally. The improvements continually being made by the larger mills make it certain that those of smaller capacity will have to improve also, and it will not pay for the sake of even material saving in first cost to start behind in the race. "Get the best" is the only motto worth following, only do not make the mistake of believing that any guarantee will of itself insure your getting the best. The better way, if you cannot trust your own experience, and my observation is that comparatively few millers do trust their own experience for enough to even partially relieve the mill builder from responsibility for the operation of the mill, is to entrust your work to some mill builder of established reputation and pay him a fair price for it.

I often hear it said by millers: "We would like to have — & Co. build our mill, only their price is higher than the others. We know they will build us a better mill, but we do not feel like paying the difference in cost." Now the ability to build the better mill comes of long experience, and this experience has cost the builder much study and expense. It is at the service of the miller, and is worth the price asked for it. I remember one mill

owner who put the matter plainly, by saying: "I want the benefit of your experience, but I do not want to pay for it." The spirit of this is but little removed from that of the beggar soliciting alms. It is, however, a fact, that in nine cases out of ten the miller does get this experience without paying for it, if he trusts the experienced builder with his work: i. e., that when the specifications and quality of work proposed to be done by the builder of established reputation are compared with those of his inexperienced and low-priced competitors, it will be found that, piece for piece, pound for pound, and quality for quality, the miller will get more for his money if he accepts the higher figure, and he will get the benefit of the builder's experience, and in reality be paid a bonus for receiving it. It does not take long by reducing the diameter of a shaft here and there, making the gearing a little lighter, and slighting the construction of the machinery and the millwright work of putting it in position, to make a considerable difference in the cost of a mill job; but no miller will be rash enough to say that the light, cheap, and poorly constructed mill will run as well, or last as long, or taken year in and year out will do as good work as the one honestly and substantially built.

Another thing which the miller is very apt to overlook when considering and comparing prices, is the probability of the mill starting successfully when completed. It is not invariably the rule that the mills built by the best builders start up without let or hindrance, for the execution of their plans has of necessity to be intrusted to other hands, but the odds are largely in favor of the mill which has been carefully designed and built, not with a view to cheapness in first cost, but to completeness and thoroughness in detail, starting without trouble, and making a flour which can be immediately placed upon the market under regular brands. On the other hand, it is almost universal that cheaply constructed and illy designed mills cost more to start than to build.

It is no light matter for a miller to be delayed, and vexed in the starting of his mill, and the cost of the delay is a most considerable item in the cost of the complete mill. Even in a mill of fifty or seventy-five barrels capacity, the difference between a poor start and a successful one will more than overbalance the difference between the highest and lowest bids, and yet the miller can with difficulty convince himself that he is doing well to pay even a few hundred dollars extra for the sake of having the better mill.

Nothing conduces more to the pleasant and profitable operation of a mill than a systematic arrangement of the machinery, so as to save room where it is most needed, and avoid using more secondary machinery than is necessary. The primary machinery of the mill is that which performs a principal part in the milling process, such as rolls, purifiers, reels, cleaning machinery, etc. The secondary machinery is the gearing, elevators, conveyors, spouts, etc., which are used simply to enable the primary machines to perform their functions in due sequence. This part of the mill is like the dead weight of a railroad train. It must be sufficient to bear the load without danger of wreck, but every superfluous pound costs money to carry. So in a mill where the primary machinery is so

located as to require a wilderness of elevators, conveyors and spouts, to carry out the diagram, the dead weight is not only an eyesore to the miller, but a most expensive thing to operate and keep in order. And without desiring to criticise millwrights too severely, it may be said that the worst jobs of the above description are those which are built by local millwrights, who, whatever their skill as mechanics, lack the ability or experience necessary to systematically plan an entire mill.

In closing I do not intend to give any advice which, however applicable, would be merely the expression of individual opinion. I have stated things in a general way and leave it to each miller and mill owner present to draw such conclusions therefrom as he may deem warrantable. I can only say that experience in mill building as in all other arts, costs time and money to gain, and when gained is worth money to the miller, which he should not begrudge paying, so long as the price is not unfair or unreasonable; and and that there is a great difference between cheapness and low price. It will be found almost invariably that the low priced mill is the dearest in the end, and that a reasonable expenditure at the outset will be the cheapest in the end. Whenever about to build or remodel a mill it would be well to bear in mind the old adage: "Whatever is worth doing at all is worth doing well."

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000,000, dividing a profit probably of over \$30,000,000. The writer, Dr. R. Wheatley, describes at length the organization of the Exchange, explains its legitimate business function, and sets forth plainly how its facilities are sometimes made use of to fleece the dear public; tells the story of one of Jay Gould's great manipulations of the market, and gives the slang of the street—a portion which is in itself an interesting contribution to the curiosities of language. Views of the Exchange, portraits of its officers, and of Vanderbilt, Jay Gould, Cyrus W. Field, Russell Sage and other operators, and other illustrations, make the paper still more interesting.

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Among the many notable changes wrought in our food supply during the past thirty years, few are more notable than those connected with oatmeal. In 1856 the country depended on Scotland and Canada for its supply. As compared with to-day its consumption was small; in fact little beyond a narrow demand for use as a remedial agent, and was principally sold by druggists. In 1852 Mr. Ferdinand Schumacher came to this country richly endowed by nature, otherwise without capital. He is a remarkable man, and like all such, has many ways peculiar to himself, and which have been powerful forces to make him a giant amongst those who furnish food for the world. He studied the oat-meal situation, became convinced that domestic oats were suitable for the manufacture of oatmeal, and commenced its preparation in a small way in 1856, and thus became the "pioneer oatmeal manufacturer."

His first mill had a capacity of twenty barrels per day and was started in an old wooden building, formerly used as a woolen factory, and its product, under the name and trade mark, "German Mills American Oatmeal," or as it was better known, "Akron Oatmeal," soon enjoyed a well-earned reputation. Out of this small undertaking, uncertain as to its ultimate success, has grown what is to-day the largest and best oatmeal mill in the country, taxed to its utmost capacity to supply the demand.

The original "German Mill" was built in 1856. The "Empire Mill" followed in 1863. The "Cascade Mill" was purchased in 1868, supplied with new process machinery and rebuilt throughout in 1876. At this time a new iron over-shot water wheel, 35 feet in diameter, 10 feet face, having 96 buckets, was placed in the "Cascade" as motive power, and supposed to be ample. On Feb. 29, 1872, the old pioneer "German Mill" was destroyed by fire, and immediately replaced by the present German Mill "A," near the Akron depot. This was greatly enlarged in 1878, and in 1879 a grain elevator, with a capacity of 130,000 bushels, was erected between the "Empire" and the "German" mills.

In 1861 the power of the "Cascade Mill," being insufficient to supply the growing demand for flour, was augmented by a 175-horse power Putnam engine, and the mill was changed to a full roller process mill. As another enterprise, during the same summer, may be noted the erection of elevator "B," at Greentown, Ohio, fifteen miles from Akron, in the very center of one of the best wheat sections in this state or country. In 1883 the most extensive of all German Mills "B," was commenced, and completed in 1884. The "Empire Mill," "Elevator," German Mills "A" and "B" are run by steam. Their engines have a power respectively of 250, 50, 125 and 425 horse-power. The "Cascade" has a combined steam and water power of 350 horses. The combined capacity of all the mills is about 2,000 barrels per diem. The mill frontage, opposite the Union depot, is 484 feet. Mr. Schumacher is now engaged in building an extensive dry-house as a desirable addition to German Mills "B." Its object is increased quantity as well as improved quality of the celebrated "German Mills American Oatmeal."

A new venture is the establishment about to be completed, of the "Akron Starch Works,"

the product of which will be in market by Oct. 1, 1885. Its manufacture will be based upon a new and greatly improved process, which Mr. Schumacher claims will make it superior to any and all other starch in the market. It will consist of the choicest particles of the best selected Indian corn. An important factor in its manufacture will be private water works, supplied from a never-failing stream of pure cold water, from the "eternal rocks."

Besides being the first one to introduce oatmeal, Mr. Schumacher was the first one to use oatmeal cutting machines, secured to Ehrichson by Re-issued Letters Patent, No. 7,542, dated Feb. 27, 1877. A recent decision by Judge Gresham, of the U. S. Circuit Court of Illinois, confirms his rights to the patent for cutting oatmeal by means of the following method, to wit: Introducing kernels lengthwise by a perforated plate or feeder to one or more knives or its equivalent, calculated to cut the grain crosswise.—*American Grocer.*

YAEGER'S NEW MILL AT CARLINVILLE, ILL.

The *Macoupin County Inquirer*, published at Carlinville, Ill., gives the following particulars of Mr. H. C. Yaeger's enterprise at that place. It says:

"In March last, Mr. H. C. Yaeger bought the 'Weer Mills' in this city, and immediately employed the Todds & Stanley Mill Furnishing Co., of St. Louis, to improve and enlarge. Some thirty millwrights have since been employed in reconstructing the works from top to bottom. It is now finished and has been running daily since Aug. 5, turning out at the rate of 600 barrels of flour in 24 hours. A short description of this immense establishment will not be uninteresting to our readers.

"We have been informed by some of the millwrights, whose skill aided in the completion, that none of the far-famed mills of Minneapolis are so thoroughly equipped and modernized as this, and we not question the truth of the statement, for both inside and out the entire establishment is simply beautiful. The building is constructed of stone and brick in first-class style. On the first floor are three lines of Todds & Stanley's Rollers, while the second, third, fourth and fifth are filled with bolting chests, purifiers, etc. In fact, each floor is loaded with a network of conveyors and machinery sufficient to bewilder a novice and lead him to conclude he has entered into a labyrinth of mysteries. The dust from the wheat cleaners and purifiers is collected by the Prinz Patent Dust Collectors, hence the mill is as free from dust and is as clean and neat as a lady's kitchen.

"All this vast machinery is moved with apparent ease and the regularity of a clock, by a new Hamilton-Corliss Engine. A brick elevator building of 50,000 bushels capacity, also a storage warehouse for flour and offals, are on the premises, but entirely independent of the mill. The product from the mill is carried to the warehouse on a little two-foot gauge track, and the grain from the cars to the elevator is carried 325 feet by a Caldwell Conveyor. Every part of the machinery works smoothly and nicely, and the entire establishment has a business-like and symmetrical appearance. The entire building from cellar to attic, is lighted with incandescent lamps, 40 in number, which almost turn night into day, as far as light is concerned.

"While every department is constructed with a view to arriving at the best results, the convenience of patrons has not been overlooked. A building has been erected at the south-east corner of the main buildings especially for the accommodation of the retail trade, where all grades of flour and mill feed are on sale. Across the street and a short distance east of the mill, is the office, a large and commodious room, well lighted and ventilated, where the main business of the establishment is transacted. Here are the bookkeepers and correspondents, who are always busy answering telegraph messages, directing shipments, etc. A full line of samples of all goods manufactured are in this room, and large dealers in flour can inspect grades and make contracts.

"Every hour both day and night samples are taken from the mill to the business office and the quality of the product tested. If the flour is off grade, it is given its position and sold for what it is worth under a special brand. By this frequent and close inspection, there is scarcely a possibility of an inferior grade getting on the market as first grade, and thus make the product of the mills unreliable to patrons. Continually there is also a record kept of the offal and at every hour in the 24, and upon any grade of wheat, Mr. Yaeger not only knows the quality of flour produced, but the number of pounds per bushel, and consequently the net business of the mill. On this careful and systematic manner of doing business has much of the success of the milling under Mr. Yaeger's supervision depended.

"In addition to all these improvements, The managers of the C. & A. Road, with that spirit ever characteristic, and recognizing the importance of this immense milling enterprise has constructed a switch a quarter of a mile long, simply to accommodate this business. And there is no doubt that the liberality of this road will meet a fitting reward in increased business in the future. Upon this switch the cars are loaded with flour for all parts of the world, and the shipping in and out makes this the busy part of our city.

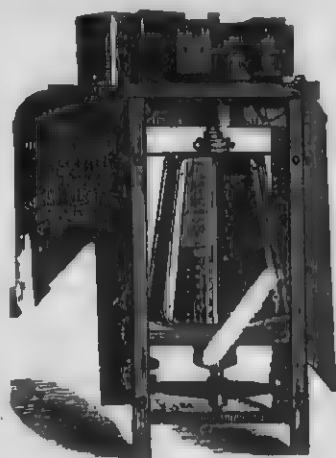
"Macoupin is the banner wheat county of the state. A good mill and good wheat must insure success to business, and men who invest so largely in a manufacturing enterprise of this kind deserve well of the community in which they make the plant. Mr. Samuel Cupples, of St. Louis, a gentleman well and favorably known in this country, from ocean to ocean, is associated with Mr. Yaeger in this business. One thousand lithographs of the mill have been ordered, which Mr. Yaeger expects to distribute to his patrons in this country and Europe.

"The favorite brands of the mill are White Silk and Royal Lily, and wherever known are deservedly popular. With the new and modern machinery, and the systematic method of manufacturing, these brands are kept up to the highest standard."

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R—Olive oil.....	3 parts.
Oil of pennyroyal.....	2 "
Glycerine.....	1 "
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To be well shaken before applying to the face and hands. Avoid getting the mixture into the eyes.

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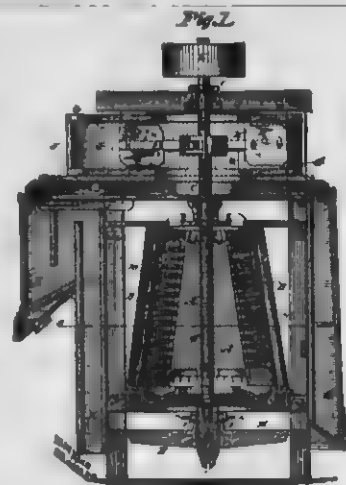
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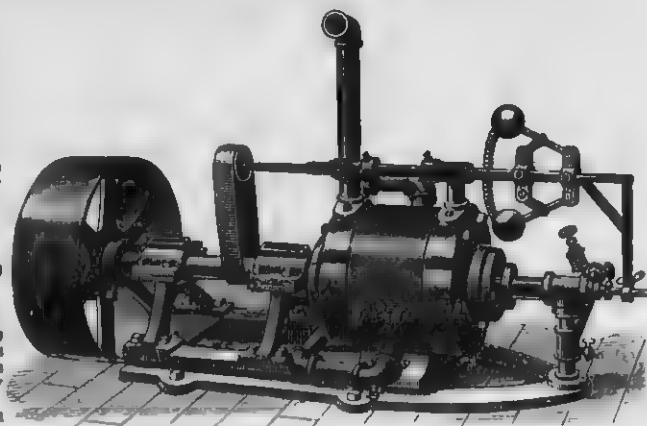
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An Industrial Revolution.—In a large Connecticut manufacturing establishment there is in operation a new style of furnace which produces more steam-power from a consumption of 1,000 lbs. of coal than can be generated by the old style of furnace which already saves 1 lb. burned in the ordinary way. In other words, the new coal furnace already saves nineteen-twentieths of the fuel, and it is believed that before being publicly announced it will be so improved that the saving will reach 49 fiftieths! The facts already developed are simply incredible to one who has not actually seen them verified.

[illegible]

1st, Condensation.—By grouping all derivative and compound words under their root or leader (as in the "Book" example quoted below), such words are adequately treated in one-third of the space required by the old arrangement. By this means nearly all the desirable material of the four and five-dollar dictionaries is presented in a convenient and handy form in Webster's Practical.

2d, Association.—We comprehend as well as remember things chiefly by their associations. For this reason any one who shall carefully read the "Book" paragraph which we reproduce from Webster's Practical Dictionary, will not only comprehend it more readily, but will be able to remember two or three times as much as would be gained by reading about the same words when treated separately as in other works.

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The following paragraph is reproduced from Webster's Practical.

Book, book, n. A collection of sheets of paper, etc., put together in literary composition, written or printed, published, or otherwise. A literary work. (*Mer.*) A volume in which accounts are kept. — **v. t.** [BOOKED (booked), BOOKING.] To enter, or register in a book. — **Book'ish, a.** Owing to books. — **Book'ism, n.** A doctrine or system of thought. — **Book'ish-er, n.** One who binds books. — **Book'ist, n.** A place for binding, etc. — **Book'ing, n.** Art or practice of, etc. — **Case, n.** A cover, as the one for holding books. — **A book-cover, -cov'ers, -er, n.** A case for a book; a cover of cloth, or other material prepared for casing a book. — **Case'y, n.** One who keeps accounts. — **Cas'ing, n.** The act of recording or entering in a book. — **Cas'ing, a.** Recording, as learned. — **Learn'd, a.** Versed in books; ignorant of life. — **Learn'ing, n.** Learning acquired by reading, — esp. as app. to practical knowledge. — **Learn'ing, n.** Learning. — **Learn'ing, n.** A complete sportsman who makes a record of bets. — **Mark'ing, n.** The practice of, etc. — **Consp'iration; systematized betting, — mark, n.** Something placed in a book by a person, as a mark of place, — place, n. A label indicating ownership, place in a library, etc., usually on the inside of the cover of a book. — **Post, n.** The post-office arrangement by which books are mailed. — **Shop, n.** A place for selling books. — **Shop, stall, store, n.** A place for selling books. — **Stand, n.** A stand for selling books in the street. — **Book-stall, n.** A support for books in the street. — **Book-stall, n.** A place for selling books; one excessively addicted to study.

(The following exhibits are from the texts of the dictionaries named).

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ITEMS OF INTEREST.

THE Ohio River at its head—the junction of the Allegheny and Monongahela—does not always have a depth of water sufficient for steam navigation. This has now been remedied by a dam built at Davis Island by the government, which makes Pittsburg the head of navigation the year round. The cost of the dam is \$900,000, and it has been seven years in the course of erection. It is an improvement of great advantage to Pittsburg and Western Pennsylvania, especially in the facilities afforded for getting out coal and other heavy articles that will not bear much handling.

A BRITISH member of parliament, figuring on the proportion of taxes paid by the English farming class, arrives at some startling results. He concludes that on an annual product of \$562,000,000, \$80,000,000 are paid in taxes; or, to put it another way, that every English bred bullock sold for \$150 has paid to national objects, of one sort and another, \$21.50, while every sheep sold for \$12.50 has paid nearly \$2 for the same purposes. He adds: "It amounts to a charge of nearly 15 per cent. on the results, and I venture to assert that no other manufacturing industry would have been patient under such conditions for so long a time."

ECONOMICAL USE OF COAL.—The steamer Burgos, built especially to carry cargoes cheaply at a low speed, recently left England for China with a cargo weighing 5,600,000 pounds. During the first part of the voyage, from Plymouth to Alexandria, the consumption of coal was 282,240 pounds, the distance being 3,880 miles; the consumption per mile was, therefore, only 83.5 pounds, and the consumption per ton of cargo per mile, .028 pound; in other words, half an ounce of coal propelled one ton of cargo a mile. It is further stated that the best locomotive performance in this country shows a consumption of about two ounces of coal per ton of freight hauled one mile, at the rate of 13 miles an hour, including stoppages; on lines having grades of from 53 to 70 feet per mile, the consumption often rises to five or more ounces.

BENEFIT OF MACHINERY.—The days of machinery, remarks a contemporary, have been for the poor man days of home-making and home-making comforts, as no other days ever were. If machinery has given the rich man luxuries, it has given the poor man the necessities and comforts of habitation, and clothing, and travel, such as he never had before. The printing press, especially, is the man's servant and benefactor, scattering abroad our intellectual wealth, raising all to an intellectual level and binding all into one whole.

NEW USES FOR STEEL.—Eight thousand tons of steel castings are used in the construction of an immense block of bonding warehouses in London. Soft Bessemer steel is now largely used in boiler making, and in a thousand other new directions steel is finding new uses. The iron age is rapidly passing away, and the age of steel has taken its place.

CEMENT FOR RESISTING STEAM.—A cement for resisting water at steam heat may be made by mixing common commercial glycerine with dry litharage into a tough dough, and applying the same to the parts to

be covered. This composition is said to answer very satisfactorily for uniting the joints of steam pipes.

GANZ & Co., of Pesth, Austria, are well known as one of the earliest makers of roller mills, and the total number of roller mills sold by them up to the 30th of June, 1885, is astounding, viz., 12,309 machines. It is instructing to note the countries whither these machines have been sent: Austria comes first with 2704 machines; then Hungary with 2172; then Russia, 2092; and Germany with 2026. Then come in order France, 664; Italy 558; England, 420; Belgium, 380; America, 253; Switzerland, 237; Danubian Principalities, 229; Spain, 199; Holland, 102; Australia, 100; Sweden and Norway, 76; Denmark, 59; East Indies, 30; Egypt, 8.—*Millers' Gazette.*

NEWS.

A new mill has been put up at Pushmataha, Alabama.

Frank Reast will establish a grist mill in Denison, Texas.

D. Johnston, grist mill owner at Fort Qu'Appelle, is about to sell out.

The Owen Sound and Northwest Milling Co. have sold their flour mill at Fort Qu'Appelle.

The Sumner Milling Co., Vincennes, Ind., has failed. Liabilities about \$60,000, assets \$35,000.

John Roberts, Orland, Ind., miller, has suspended. Real estate is valued at \$53,000, encumbered for \$30,000.

Manly & Richards, of Michigan Centre, Mich., and the Sparta Mills Co., Sparta, Mich., are reported to have failed.

Wm. Annesser will build a 125-barrell roller mill (Gray rolls) at Ft. Worth, Texas. Cost, \$30,000. It will contain 14 sets of rolls.

The Alliance Milling Co., Denton, Texas, reported as chartered last week, will build a flour mill with daily capacity of 100 barrels.

V. M. Ayres, miller at Arkansas City, is reported to have made an assignment, with liabilities of \$40,000 and assets about \$20,000.

The flour mill, previously reported as to be built at Sweetwater, Tenn., by the Sweetwater Mill Co., will cost, including warehouse, \$35,000.

Smith, Hippen & Co.'s elevator at Green Valley, Ill., burned Oct. 6, with contents, consisting of 30,000 bushels of wheat, rye and oats. Partially insured.

A most terrible accident occurred at Sage Brothers' large flouring mill at Elkhart, Ind., Oct. 13. Norman, a son of one of the proprietors, while doing some repairing around the machinery, was caught in a wheel and the lower portion of his body ground up. He expired within an hour. He was aged 23, and leaves a wife and child.

The Humboldt Mill, in Minneapolis, narrowly escaped destruction by fire Oct. 17. By the prompt and heroic action of three millers, Thos. Spellman, Mike Bowe and Wm. Porter, the fire was got under control and the mill saved. The loss, principally on account of water, is estimated to be about \$6000.

A shocking accident occurred in the Wisconsin Central flouring mill at Manitowoc, Wis., Oct. 13. The proprietor, Jacob Fliegler,

while bending down to examine some machinery in motion, had his right arm caught between two large cog-wheels, crushing the arm from the wrist to the elbow. It took fully twenty minutes before Mr. Fliegler could be released from his position, and during all this time he coolly gave directions as to the manner of running the wheels and extricating his mangled arm. As soon as liberated he was conveyed to his home in care of physicians. It is feared that the accident may result fatally.

The following are among the many orders received by The Case Manufacturing Co., Columbus, Ohio, during the past month: from Wheelock Bros. & Davis, Kemseka, Dakota, for 6 pairs of rolls with patent automatic feed; from Morley & Nichols, Cherokee, Kansas, for a full outfit of breaks, rolls, purifiers, centrifugal reels, etc., for a complete roller mill on the Case system; from London, England, (per cablegram) for 3 Little Giant break machines, 2 pairs of rolls and 1 purifier; from Kent Yates Callahan, Wytheville, Va., for all the necessary rolls, purifiers, centrifugal reels, scalping chests etc., for a full roller mill on the Case system; from Dufur & Dufur, The Dalles, Oregon, for 14 pairs of rolls with patent automatic feed and a complete outfit of machinery and supplies for a first class roller mill; from Barnard & Leas Mfg. Co., Moline, Ills., for 1 No. 1 single purifier, for John S. Ewing, Colora, Md; from John Cornelson, Walton, Kansas, for 12 pairs of rolls with patent automatic feed, and a full outfit of breaks, purifiers, bolting, centrifugal and scalping reels and all necessary shafting, pulleys and gearing for a complete roller mill; from J. B. Miller & Co., Ashley, O., for 2 pairs of rolls with patent automatic feed; from Wm. Bradley, Centerville, Iowa, for 4 pairs of rolls with patent automatic feed; from A. L. Strong & Co., Omaha, Neb., for 15 pairs of rolls with patent automatic feed, 2 centrifugal reels, 2 scalping chests and 1 purifier; from J. H. Williamson, Yorktown, Ind., for 12 pairs of rolls with patent automatic feed, 2 bolting chests, and one 6 reel scalping chest; from O. M. Hill, Williams' Ranch, Tex., for one No. 1 single purifier; from Sampson Hoch, Dora, Ind., for all necessary machinery for a full roller mill on the Case system, using 12 pairs of rolls with patent automatic feed; from J. J. Hills & Co., Leaf River, Ill., for 12 pairs of rolls with patent automatic feed, and one 4-reel scalping chest; from A. H. Fairchild, Honeoye Falls, N. Y., for one No. 1 single purifier for Morey & Goho, Danville, N. Y.; from A. L. Strong & Co., Omaha, Neb., for one bolting chest for Blowers & Pheasant, Osceola, Neb.; from The Richmond City Mill Works, Richmond, Ind., for one Little Giant 1st break machine.

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A correspondent of the *Albany Cultivator* describes his experience with axes as follows:

I well remember my first axe and my early experience with it. It weighed 4½ pounds, being the heaviest one I could find at the time. I was fresh from school—fresh from a class in natural philosophy, one of my favorite studies. I knew all about *inertia*, and had learned something of the force of gravity and the laws of falling bodies; had rightly guessed that chopping wood might be hard work, and determined that my knowledge of physics should help me out. I would have a heavy axe, a long handle—would move slowly, and take strokes that would count when they fell. My axe handle was 34 inches in length, the longest one in the store. I had hired a tough little French Canadian, weighing about 120 pounds, to help me in this work. When he came he brought an axe—a mere toy I called it. I think it weighed 2½ pounds, with a handle only 26 inches long. I told him I had a fair-sized job for him, and thought it would pay him to buy a full-grown axe. He smiled and said he guessed his would do. I tried to explain to him the beauties of a heavy axe and the wonderful advantages of a long handle. But it was all in vain; I was only wasting time; he could not understand it.

"Poor fellow," I thought; "he knows nothing of the beautiful science of physics. It is too bad that he should thus waste his strength through ignorance, and be unwilling to listen to the voice of wisdom."

We went to the wood lot and began work. I had decided that we would work separately during the first day or two, in order that I might show him what I could do. As I began to swing my axe I felt proud of its ponderous blows that rang through the woods, and rather pitied the poor fellow who was drumming away with his little axe, taking about two blows to my one. Presently I had to stop to rest, and then again, and still again; but Joe, my man, kept pecking away quietly, steadily and easily. Every few minutes I would stop to take a breath, but Joe seemed perfectly able to do all necessary breathing without stopping his work for the purpose. When night came we piled up our wood and measured it. Joe's pile measured one and a half cords, mine only three-quarters of a cord.

During the early part of the day I had planned giving Joe another lesson in the evening, to see if I could not make him understand the elementary principles of wood-cutting and the philosophical requirements of an axe. But when night came I decided that perhaps it would be as well to let him go on in ignorance, and thereafter remain silent upon the subject. The next day I felt lame and stayed at home. Joe put in his cord and a half as usual. When I went to the woods again Joe and I worked together. Not many days passed before I found an excuse for buying a lighter axe and a shorter handle. And every axe and handle that I have bought since has been lighter and shorter than its predecessor. Whenever I use an axe now I select one very much like Joe's, both in weight and length of handle. I can use this without getting out of breath, and can hit twice in the same place. The re-

sult is that I can do more and better work and save a vast amount of strength. I write this as a word of caution to the inexperienced wood-chopper when about to purchase an axe.

DAMPING INDIAN WHEAT.

The writer in the *Millers' Gazette* says, referring to the position we have taken against damping wheat to add to its weight:—"There has also lately been considerable objection evinced by writers in the bakers' journals against the practice of damping this wheat (Indian), an unworthy accusation being made against the millers of using water to increase its weight." Mr. George Miller also asserts that "no miller who knows his business would ever add water to such an extent as to permeate his flour." To which we reply that we have before us now a letter from a miller of as high standing as Mr. George Miller in the business in which the writer says:—"You are quite right in your statements in reference to the use of water. It has been extensively used by intelligent millers in the past, ostensibly for the purpose of improving the flour, but in reality with a view to pecuniary gain. Nothing less than five per cent. of added water will satisfy some of our particularly scientific masters. In hundreds of instances 100 quarters has been booked against me for 95 because I would not put in the other five per cent. in water. These gentlemen did not know that it was easier for me to take an average yield out of 95 quarters dry wheat than it was out of 100 quarters wet." We were lately in and over a combined stone and roller mill where Indian wheat is used, and used damp. This wheat comes in sacks, and when delivered at the mill is thrown sack and all into a tank of water, and allowed to soak in water till the miller takes it out. It is then allowed to drain a little, hoisted to the loft containing the hoppers over the stones and emptied into them without any cleaning or separation of stones, mud, or foreign seeds!! We smiled derisively at the sight. The name and locality of this mill can be had on application. But passing the letter of the working miller, and the evidence of our own eyes in more mills than one, let us turn to the report of Messrs. McDougall Bros. on Indian wheat. These gentlemen published some explanatory "notes" on each sample of wheat milled by them, and on p. 25 of their report, referring to the average hard white Indian wheat, Lot 8, we find the following:—"It is also a profitable wheat for millers, owing to its requiring 8.4 per cent. water to render it sufficiently mellow for use." A "note" to average hard red Indian wheat, Lot 4, on same page, says: "A profitable wheat for millers, as it takes 7.6 per cent. water to render it sufficiently mellow for use." Referring to the yield of bread from these Lots 3 and 4, and which they describe as exceptionally large! (92 loaves 39 ounces; and 94 loaves 8 ounces) they say what is sufficiently obvious—"the yield * * * * would have been further increased had they not (the wheats) been previously mellowed with water." If we turn to India itself we find Lieutenant-Colonel Laughton, Assistant Commissary General, who visited England last year to find out the latest improvements in milling and baking, in his book published since his return saying, "In India it is impossible to grind (with

stones) the hard, flinty wheats without previous damping. * * * * The damping should not be carried further than just to penetrate the bran. The best method is as follows: Place the wheat in a sieve, and thoroughly wash the wheat for one minute, rubbing it between the hands. Drain and spread out to dry for an hour only or thereabouts." Where damping is not carried further than described by Colonel Laughton no objection can reasonably be taken, when stones are used in reducing the wheat, and we have only quoted the above to show how unnecessary is the 7.6 to 8.4 per cent. water advised by Messrs. McDougall Brothers, even when reducing the wheat by rollers. We do not believe the hardest Indian wheat when it reaches our millers is any harder than the wheat used by Hungarian millers, and they use no water. They give eight or more reductions in reducing wheat to middlings, each reduction slightly closer than the last, and in reducing middlings to flour another eight or more reductions. Our millers allow only about three or four reductions for middlings, and two or three to convert middlings into flour. They can only do this by excessive pressure of the rolls on the material, which pulverizes the brittle bran of the hard wheats. To avoid this some of them would have us believe is their sole reason for using water to toughen the bran. We say, no water, and more and tenderer reductions on wheat and middlings. Should bran toughening still be necessary, we would suggest cool damp steam. But we are asked to believe that Indian wheat is so coated with mud as to render washing necessary. No doubt Indian wheat in that condition can be had, and had very cheap, but we deny that that is the usual condition of this wheat. We say so from samples before us from all over the Kingdom, Ireland, and India, and find nothing that a scouring or brush machine cannot remove. Wheat is not so scarce or dear that filthy Indian rejections are necessary to avoid famine or famine prices. It is easy to see why millers should think otherwise, but we fail to see why bakers should.—*The British and Foreign Baker and Confectioner, (London).*

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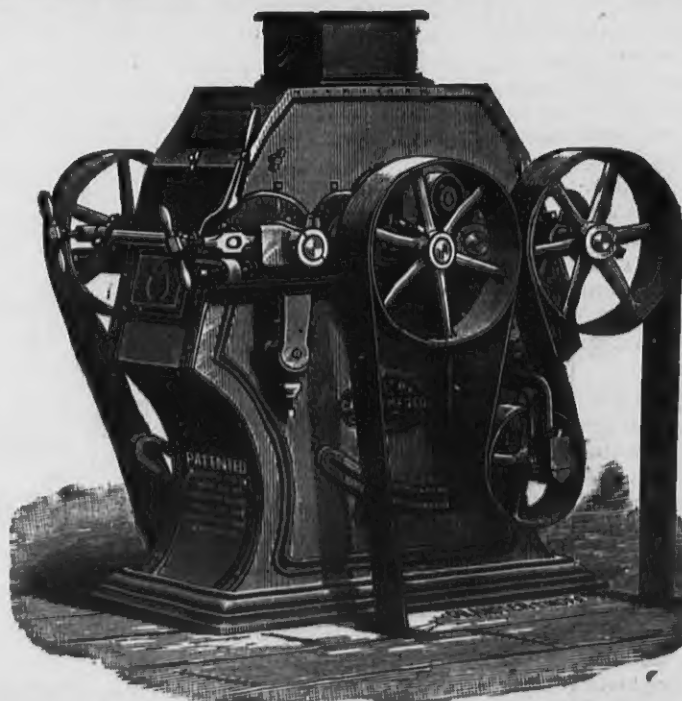
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